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ORIGINAL LECTURES.

ON INFANT FOODS.

A Lecture delivered by invitation before the College of Physicians of Philadelphia.

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IN attempting to discuss the problem of infant foods, I shall begin by assuming that the natural food of the human infant is the best infant food. Without pausing to give the grounds on which it is based, I shall merely add, that the conviction has constantly strengthened with the progress of chemical analyses of human milk and of the various substitutes which have been proposed, that the above assumption is the safest and least presumptuous one which can be made in the present stage of theoretic and practical knowledge.

But what is human milk? To answer this question satisfactorily, we should know at least three things: 1. All the components; 2. Their relative proportion; 3. Their chemical and physiological properties.

Strangely enough, present knowledge on all these points is very far from satisfactory. With reference to the first point, it is sufficient to state that no complete analysis of woman's milk has yet been made. As to the second, I am not referring to the fact that the milk necessarily varies with the interval since parturition, the nutrition and constitution of the mother, and numerous other variable elements, but to the much more important one, that the average composition of the milk of healthy nursing women is by no means satisfactorily established. You will be surprised, I think, on turning to the literature of this subject to find how widely different are the figures obtained by investigators, and variously adopted, usually without critical consideration, in works treating of the nutrition and diseases of children. Finally, in reference to the third point, our knowledge of the properties of the components themselves is extremely meagre. We know, as yet, very little concerning the true nature of the nitrogenous bodies, which are lumped together under the head of albuminoids. And as to the fat of human milk, no separation into the many oily and fatty bodies, of which it is made up, has as yet been attempted.

It may be said that this is foolish hypercriticism—that if we do not know everything, we know sufficient to conduct the nutrition of infants on a sound basis of adequate knowledge. But many reasons could be given under the heads previously specified for regarding the last assumption as premature. Our time will not permit us even to allude to these, but will enable us to speak only of the one practical issue which it is our business to deal with this evening. This is, granting that woman's milk is the best infants' food, in what manner should the nature and proportions of the components be determined of any substitute we may be necessitated to employ? Certainly, only by knowing, in the first place, the average composition of human milk.

As this point is fundamental, and as the wide diversities I have just alluded to existed concerning it, I have thought it well to devote the past four months to its study. In this labor I have had the cordial co-operation of Dr. A. M. Thomas, Chief of Medical Staff of the Emigrants' Asylum and Hospital, and, during the later part of the inquiry, of Dr. K. Parker, of the Infants' Asylum of New York. Both of them have given their personal attention to the collection of the samples, which, in every case, were taken from healthy women, mainly young and primiparæ. All the points of interest, with regard to the history of the women, the child, and the sample, have been tabulated and coördinated, and will probably be published in connection with a future monograph devoted to the topic of human milk. This would not be a proper place for these details, further than adding that the samples usually amounted to two ounces, were taken in most instances two hours after time of last nursing, and were generally the entire contents of the gland.

The sources of variation in the multitudinous analyses of woman's milk that have been previously published, are principally three in number—the most important being the differences in the methods of analyses; next, the variations in the constitution of the milk itself; lastly, the circumstances connected with the collection of the sample. Without delaying to discuss these matters, which would require much time and precision of statement, I shall bring before you to-night only so much of the results thus far obtained as are needed for our present purpose. They are to be regarded as an approximation, to be still further modified by incorporation of the results of other analyses still in progress.

Analyses of Forty-three Samples of Woman's Milk.

Reaction uniformly alkaline.

	Average.	Minimum.	Maximum.
Specific gravity,	1.0317	1.030	1.0353
Water,	86.766	83.34	89.09
Total solids,	13.234	10.91	16.66
Total solids not fat,	9.221	6.57	12.09
Fat,	4.013	2.11	6.89
Milk-sugar,	6.997	5.40	7.92
Albuminoids,	2.058	0.85	4.86
Ash,	0.21	0.13	0 35

Not only was the reaction alkaline when the samples were fresh, but, with one exception, in which it was neutral, this alkalinity was found to remain twenty-four or more hours after.

The most striking feature in these analyses is the great range of variation in the amounts of certain constituents, more especially in the albuminoids, the maximum, 4.86 per cent., being nearly six times the minimum, which is only 0.85 per cent. The next most variable constituent is the fat, the maximum being more than three times the minimum. Then come the saline matters, nearly three, the last of all the milk-sugar, which differs but little from the mean (6.997 per cent.) in most samples. In other words, the most striking peculiarity in woman's milk is not the constancy, but the great variability in its composition. Furthermore, this variability is by far the greatest in the constituent most essential to nutrition, the albuminoids, and diminishes in degree of variability in proportion as the constituent becomes less and less essential to nutrition, becoming very nearly constant in the case of milk-sugar, the function of which is not nutrition but heating; by which nature appears to intend to teach us that the rate of nutrition in an infant may safely vary within wide limits, but that the

animal heat of an highly organized and rapidly developing creature must be maintained *coûte qu'il coûte*. To maintain at a temperature somewhat exceeding that of an adult, a creature whose vital processes on the one hand are of great activity, while on the other hand the supplies of heat due to cerebral impulses and self-originating locomotions are extremely small, requires the rapid consumption of available fuel, and the abundance of carbohydrates in the milk supplies this most imperative want.

Without stopping to draw out the significance contained in the proportionality of the constituents, both as considered in themselves and as compared with the new-born of other mammalia, let us hasten on to the comparison of human milk with its nearest analogue. This is properly asses' milk, but as this is not and never will be generally available, it will be more profitable for us to consider the cheap and universally accessible cow's milk. For a similar reason, I shall not institute a comparison between the above average and that of the rich milk of blooded cattle, the Alderneys, Jerseys, and so on, nor with selected samples from the best ordinary milch-cows. Rather, as such comparison will be of greater practical utility, I shall adduce the analyses of unadulterated whole commercial or "market" milk. And as this market milk is itself the average of a great number of samples, it is useless, so far as it is concerned, to give the maxima and minima of its individual constituents.

As determined by methods identical with those employed in the analyses of woman's milk, I shall state, therefore, the following results, obtained upon samples of unadulterated cow's milk, such as is sold by farmers in New Jersey to the citizens of New York and Philadelphia.

Analyses of Eleven Samples of Whole Market Milk.

Water,	87.7	per cent.
Total solids,	12.3	"
Total solids not fat,	8.48	"
Fat,	3.75	"
Milk-sugar,	4.42	"
Albuminoids,	3.42	"
Ash,	0 64	"

As in the case of woman's milk, the slight discrepancies noticeable are due to the fact that the figures for "total solids" were those obtained by appropriate separate determinations, and of course do not precisely agree with the figures obtained by mere addition of the solid constituents.

Before proceeding to make a comparison, I wish to quote here the results given by König (*Chemie der mensch. Nahrungs- und Genussmittel*), deduced in each case from the analyses of many hundred samples of woman's and cow's milk, and to call attention to the fact that whilst these results include determinations effected by very many and diverse methods of all descriptions of samples, and present a distinction between caseine and albumen (a distinction which cannot be sharply effected by present analytical methods), yet as a whole they are similar to and support the inductions which I shall base upon the analyses above given.

Woman's Milk.

	Mean.	Minimum.	Maximum.
Water,	87.09	83.69	90.90
Total solids,	12.91	9.10	16.31
Fat,	3.90	1.71	7.60
Milk-sugar,	6.04	4.11	7.80
Caseine,	0.63	0.18	1.90
Albumen,	1.31	0.39	2.35
Albuminoids,	1.94	0.57	4.25
Ash,	0.49	0.14	?

Cow's Milk.

	Mean.	Minimum.	Maximum.
Water,	87.41	80.32	91.50
Total solids,	12.59	8.50	19.68
Fat,	3.66	1.15	7.09
Milk-sugar,	4.92	3.20	5.67
Caseine,	3.01	1.17	7.40
Albumen,	0.75	0.21	5.04
Albuminoids,	3.76	1.38	12.44
Ash,	0.70	0.50	0.87

The same striking peculiarities are noticeable in the above analyses of woman's milk. The greatest variable is the albuminoid constituent, the maximum being more than seven times the minimum; the most nearly constant is the milk-sugar, varying little from the mean of 6.04 per cent., which is likewise the largest of the solid constituents.

When we compare woman's with cow's milk, it is the great differences and not the similarities which surprise us, and demand study, recognition, and utilization in the solution of the problem of artificial infant's food. In woman's milk we have a persistently alkaline liquid, of a somewhat animal, usually disagreeable, and very rarely sweetish taste, of somewhat greater specific gravity (1.0317) than cow's milk (1.029). Although it has less water, and greater total solids, and total solids not fat, than cow's milk, it is by no means so opaque, and with its thin and watery consistence gives us a notion the reverse of true with regard to its real composition. Agreeing with cow's milk in the fact that the milk-sugar in both is the chief solid, it differs in that its milk-sugar largely exceeds the milk-sugar of cow's milk. It likewise exceeds in fat. In albuminoids it falls far below. And whilst by present modes of analysis the separation of the so-called caseine from the so-called albumen is not accurately performed, yet the results are approximately correct, and have a very great value in pointing out the most important of all the differences between the two secretions, which is that the fraction of the total albuminoids in cow's milk which is coagulable by acids is far greater (perhaps four times) than the non-coagulable part.

In woman's milk, on the contrary, the reverse is true, and the non-coagulable part much exceeds (perhaps by more than twice) the coagulable portion. And whilst the absolute amount of ash is less, the relative amount of potash is greater, in woman's than in cow's milk.

For reasons which will appear further on, it would seem that the best solution of the problem of artificial infant feeding is to be found in the substitution of cow for human milk. But, inasmuch as the secretion of the herbivora is radically and in all particulars different from that of the omnivora, cow's milk is profoundly altered, so as to assimilate, in the ratio and nature of its constituents, human milk.

To discuss the various methods by which it has been proposed to effect this result would far outrun my present scope, which is only so much of the general discussion as relates to the influence exerted upon cow's milk by the addition of the various articles of infant food now manufactured and offered for sale. This influence, we shall find, is chiefly of a mechanical or physical character, and does not necessarily involve the discussion of those chemical changes, at present time under investigation in many quarters, the practical results of which have not yet been satisfactorily determined, and belong, therefore, to the future of this subject.

The method hitherto employed is spoken of as mechanical for reasons based partly on the practice of physicians and partly on laboratory experiments. The mere addition of water to cow's milk is sufficient to reduce the percentage of albuminoids to the same

amount as its percentage in human milk. But this addition does little to diminish the size and compact character of the clot of cow's milk. This last is effected, as far as it actually is effected, which is only partially, by the addition of the various attenuants composing manufactured infant's food, whether that attenuant is starch, gum, sugar, dextrine, or other bland nutrient. This explanation of the utility of manufactured infant's foods accounts for the seeming anomalies in present medical practice, which at first sight appear very startling and inconsistent with generally accepted physiological doctrines. For whilst admitting that the secretions of the salivary and pancreatic glands are insufficient in the early stages of infancy to digest more than very limited amounts of starch, yet physicians frequently use with good results a farinaceous food like Ridge's, which contains 77.96 per cent. of starch, or like Robinson's patent barley, which contains 77.76 per cent. of starch. But when we consider that the utility of this starch is not in the way of infant's food, for which it is not adapted, but as an attenuant of the large amount of diluted milk with which it is mixed, then the seeming contradiction between theory and practice disappears.

To discover whether this interpretation is in accord with experiment, the coagulation was effected in the presence of similar attenuants. In the first place, the total albuminoids were determined in a sample of whole cow's milk, and were found to be 3.39 per cent. The so-called caseine was then separated by coagulation with acetic acid, and amounted to 2.42 per cent. On boiling the filtrate, 0.26 per cent. of albumen so called separated out, leaving a deficiency of 0.71 per cent. of albuminoids to be accounted for. A direct determination of the albuminoids in the filtrate from the albumen, gave an additional yield of 0.76 per cent., showing that both coagulation and boiling of the filtrate subsequently had left nearly one-fourth of the total albuminoids in solution.

Ten grammes of the same milk, together with 25 grammes of cane-sugar and 110 c.c. of water, were treated in like manner, the precipitates being exhaustively washed. I obtained:

As precipitated by acid,	3.13	per cent.
" " by boiling,	0.40	"
Precipitated by copper sulphate from filtrate,	1.14	"
	4.67	"
Total albuminoids,	3.39	"
	1.28	"

In other words, the precipitates carried down with them 1.28 per cent. of saccharine matter, which could not be removed by washing.

Some barley-water was then made and filtered through ordinary Swedish filter paper, the clear filtrate being used in the following experiment. Ten grammes of the same milk as before were mixed with 110 c.c. of the barley-water. I obtained:

As precipitated by acid,	5.21	per cent.
" " by boiling,	0.37	"
" " by copper sulphate from filtrate,	1.35	"
	6.93	"

That is to say, the precipitates carried down with them from the clear barley-water 3.54 per cent. of barley extract, which could not be removed by washing. In this case, the attenuants of the clot exceeded in weight the coagula themselves.

An experiment with grape-sugar yielded results closely resembling those with cane. With gelatine a very remarkable result was obtained. Ten grammes of the same milk were added to 110 c.c. of a solution of 1 part of gelatine in 150 parts of water. Although the gelatine was so attenuated, it entirely prevented the precipitation of caseine on the addition of acid, and what is likewise interesting, appeared to arrest decomposition, the white jelly not having altered after a week's standing.

Ten grammes of the same milk were added to 110 c.c. of clear starch-water (filtered through Swedish filter paper). I obtained:

As precipitated by acid,	3.07	per cent.
" " by boiling,	0.36	"
" " by copper sulphate in the filtrate,	1.08	"
	4.51	"

Or 1.12 per cent of starch carried down and not separable by exhaustive washing.

The utility of diluting cow's milk until its percentage of albuminoids does not exceed that of human milk, and adding some bland attenuant, is obvious. But the special virtues of the *extractive* of barley or oatmeal, as compared with starch, and the relative value as nutrients of sugar, gum, dextrine, gelatine, barley, oatmeal, etc., and their relative advantages when thus employed, have been very imperfectly determined. It is much to be desired that new physiological and chemical experiments directed especially to these all-important factors in infant nutrition should be instituted. I shall have occasion to refer to the same points in connection with Liebig's Foods.

An examination of the great variety of infant foods, the analyses of which are given in the following pages, shows that they can be classified most conveniently under the three heads of Farinaceous, Liebig's Foods, and Milk Foods (including condensed and preserved milk).

I. *Farinaceous.*

A.—Wheat, previously prepared by baking, including:

1. Blair's Prepared Wheat Food; 2. Hubbell's Prepared Wheat Food; 3. Imperial Granum; 4. Ridge's Food.

B.—Mixtures of various cereals:

5. "A B C" Cereal Cream; 6. "A B C" Cereal Milk; 7. Robinson's Patent Barley.

II. *Liebig's Foods.*

8. Mellin's; 9. Hawley's; 10. Horlick's; 11. Keasbey and Mattison's; 12. Savory and Moore's; 13. Baby Sup No. 1; 14. Baby Sup No. 2.

III. *Milk Foods.*

15. Nestlé's; 16. Anglo-Swiss; 17. American-Swiss; 18. Gerber's.

Class I.—A.

	1. Blair's wheat food.	2. Hubbell's wheat food.	3. Imperial granum.	4. Ridge's food.
Water,	9.85	7.78	5.49	9.23
Fat,	1.56	0.41	1.01	0.63
Grape-sugar,	1.75	7.56	trace	2.40
Cane-sugar,	1.71	4 87	trace	2.20
Starch,	64.80	67.60	78.93	77.96
Soluble carbohydrates,	13.69	14.29	3.56	5.19
Albuminoids,	7.16	10 13	10.51	9.24
Gum, cellulose, etc.	2.94	undeterm'd	0.50	
Ash,	1.06	1.00	1.16	0.60

1. *Blair's Wheat Food.*—It is claimed that this is prepared from choice wheat in such a manner as to retain all the nutritive constituents and reject those which are irritating or otherwise objectionable. Moreover, that by cooking such physical and chemical changes have been brought about as to facilitate mas-

tication and the subsequent action of the fluids of the stomach, thereby rendering the food more easily digested. It is stated to be especially beneficial in intestinal diseases like dysentery, cholera infantum, etc.

Uncooked, this flour has a sweet pleasant taste. When cooked according to directions it forms a very smooth paste with a faint tinge of color, resembling arrowroot in its flavor and quite palatable without the addition of salt, sugar, milk, or other accompaniments.

2. *Hubbel's Wheat Flour.*—Claimed to be made from wheat alone, floured and carefully baked from eight to ten hours, at about the temperature of boiling water. "It includes all the flesh-forming constituents, earthy and saline elements of the grain, with only a portion of the starch, and of the silicated coating. It keeps without change."

This flour is quite sweet and palatable even in its uncooked form, and when moistened with the saliva is more pasty than the Blair's wheat flour. When cooked it forms a perfectly white, smooth paste, with a very delicate flavor. It is more starch-like in consistency than Blair's, a difference due in part to the larger percentage of starch, and less pronounced in flavor, this being probably due in some degree to the smaller percentage of fat. In both Blair's and Hubbel's the per cent. of gum, cellulose, etc., is extremely small, in the latter so small that it was not determined. In nitrogen Hubbel's is much richer than either of the other two preparations, and its value for purposes of nutrition correspondingly greater. The reaction of Blair's food and of Hubbell's is in each neutral.

The excess in the amount of saccharine matter in Hubbell's food above that contained in ordinary wheat flour induced me to write for particulars of the change which it had undergone. The process, I was informed, is as follows: A large baker's oven is heated to about 340° to 360° F. The flour, contained in shallow Russia iron pans, is then put in, the fire having meantime been withdrawn, the oven closed, and the flour left there about twenty-four hours. When the oven is reopened the temperature will have fallen to 100°, and after sieving, the prepared flour will be ready for use. The flour used is the best grade as made by the roller process, the second grade containing more starch, less gluten, being that bought and used by bakers.

The two following analyses, the first of Hubbell's prepared wheat flour, the second of the flour from which the first was obtained by the process of baking as conducted in the manner above described, are interesting and important as elucidating the nature of the changes thus induced.

	Wheat flour.	Same baked.
Water,	9.02	7.78
Fat,	1.01	0.41
Grape-sugar,	2.34	7.56
Cane-sugar,	2 46	4.87[1]
Starch,	76.07	67.60
Soluble carbohydrates,	5.66	14.29
Albuminoids,	7.47	10.13

It will be seen that the flour has lost moisture in baking, and also a portion of its fat. These changes, however, are of little moment compared with the considerable decrease of starch and its conversion into saccharine bodies. The soluble carbohydrates are considerably more than doubled, and this change is one of the greatest value and importance, so far as the dietetic value of the prepared food is concerned. The considerable increase in the percentage of albuminoids I am unable to account for.

3. *Imperial Granum.*—It is stated to be "in composition principally the gluten derived by chemical process from very superior growths of wheat—a solid extract." Dr. Fowler states (*Amer. Journ. Obstetrics*, April, 1882), as the result of his microscopical examination, that if the material from which this preparation is derived contains any gluten at all, the "chemical process" resorted to in order to extract it has at the same time either destroyed it, or so altered its character as to render it no longer recognizable by the usual tests. This is an excellent illustration of the difficulty which is encountered in deciding with the microscope upon the constitution of a cereal after treatment, for whilst Dr. Fowler's statement of the microscopic appearance is in accordance with my own observations, yet as a matter of fact the imperial granum contains 10.51 per cent. of albuminoids. On the other hand this is not sufficient by any means to bear out the statement that the imperial granum consists principally of gluten. According to Dr. Fowler, it is simply coarse barley flour. My own observations make it a wheaten preparation.

4. *Ridge's Food.*—It is advertised as "prepared from carefully selected winter wheat," reduced to an almost uniform fineness. The product is then thoroughly cooked by a steam-baking process, which gradually changes a large proportion of the starch into dextrine, excluding only the woody fibre. It is afterwards rendered a little sweet and slightly alkaline.

Dr. Fowler states (*loc. cit.*) that the Ridge's food is apparently barley flour finely ground, and that the odor, dough, and microscopic appearance indicate no other ingredients. I have placed it, in accordance with my own observations, among the wheat preparations. Both Imperial Granum and Ridge's food when cooked are very palatable. Both have a neutral reaction. Both have a considerable percentage of albuminoids, that of Imperial Granum in the two samples analyzed being the higher, and both have a very high percentage of starch.

It should be very carefully borne in mind that wheat flour after carefully baking is extensively altered, and that the albuminous bodies become considerably more soluble in water. A wheat flour, which in its original condition would yield after baking a very considerable amount of crude gluten on washing, after baking will leave a much smaller quantity, and for this reason the percentage of crude gluten in baked flours cannot be roughly estimated by washing and drying. For the same reason a baked wheat flour may be mistaken for barley flour, which gives a non-glutinous dough.

Class I.—B. *Mixture of Various Cereals.*

	6. "A B C" Cereal Milk.	7. Robinson's Patent Barley.
Moisture,	9.33	10.10
Fat,	1.01	0.97
Grape-sugar,	4.60	3.08
Cane-sugar,	15.40	0.90
Starch,	58.42	77.76
Soluble carbohydrates,	20.00	4.11
Albuminoids,	11.08	5.13
Cellulose, gum, etc.,	1.16	1.93
Ash,	.....	1.93

5. *"A B C" Cereal Cream.*—Stated to be "prepared from the most nutritious and digestible parts of the choicest wheat and barley, with all impurities removed." It appears to be a coarse meal of wheat and barley, but I did not analyze it, the box which I purchased being probably old and its contents spoiled.

6. *"A B C" Cereal Milk.*—"Prepared by a scientific admixture of the nitrates and phosphates of wheat with the whole barley; and after adding the required sugar, we have secured an analysis almost identical with human milk. The wheat is first cleansed, then hulled,

[1] With some dextrine.

coarsely ground, and the surplus starch removed, leaving the nitrates and phosphates. The barley is hulled, crushed, and mixed with a proper proportion of the wheat nitrates and phosphates. The mixture is cooked by steam, desiccated, ground into fine flour, specks bolted out, and the requisite amount of sugar added."

The statement that this food corresponds nearly with human milk in its nutritive ingredients is untrue. The proportion between its various constituents is entirely unlike that in human milk, and more than half consists of starch, a body entirely foreign to milk.

7. *Robinson's Patent Barley.*—"Patent barley, technically, is ground pearl barley. Yet this preparation, while possessing most of the characters of what it purports to be, is somewhat unlike pure barley flour. Its dough is more adhesive, and the white color, together with the mild barley odor, suggest the admixture of wheat flour. No gluten cells are seen, but there are numerous granules unaffected by iodine, and turned red by carmine (albuminous matter). The microscopic examination shows starch granules free and in bundles, held together by the cellulose. The larger corpuscles are probably those of wheat." I have adopted this description of Dr. Fowler, although I am inclined from my own observations to regard the preparation as merely barley flour.

The first three are dried foods, in brown or granular masses, and very sweet; the Mellin's food looking and tasting very much like pulverized candy. Their aqueous solutions besides this sweet, had an after-taste of alkaline salt. Under the microscope Horlick's food exhibited very few starch granules, some cellulose, hairs of wheat, but mostly dark bundles of entirely unrecognizable granular matters, probably converted starch. Mellin's food goes almost entirely into solution, and I failed to recognize under the microscope the minute irregular granular matter left behind. The materials sent to me by the manufacturers of Horlick's food, as representing their regular consumption, consisted of fine white wheat flour not baked, good barley malt, and pure bicarbonates of soda and potash. Singularly enough, the reaction of the Horlick food analyzed was acid; that of the Hawley's food was acid likewise, while the Mellin's food was alkaline.

The analyses reveal certain striking points in connection with these Liebig's foods. The percentage of fat is extremely low, that of grape-sugar very high. In Horlick's and Mellin's there is no unconverted starch, in Hawley's 11 per cent. In Mellin's there were 5.95 per cent. albuminoids, and, in both the others, the percentage was very low; that in Horlick's, the larger, being but 6.71 per cent. Hawley's is very light-colored, less sweet than the other two, is more finely powdered, and has a smell resembling that of a cereal which has been submitted to torrefaction. The 10.97 per cent. of starch indicates either that the wheat and barley malt have undergone very partial conversion into grape sugar, or that this percentage of starch has been added in some form after the liquid products of the conversion have been evaporated to dryness.

In my first paper upon this subject (*Sixth Annual Report of the New Jersey State Board of Health*) I fell inadvertently into an error in speaking of Mellin's food. The original table (p. 206 of that article) stated that this food contained 5.95 per cent. of albuminoids, which was correct. Subsequently a second table was prepared for convenience in writing out my work, and into this table the clerical blunder was introduced of including the albuminoids, 5.95 per cent., along with the insoluble residue, 3.46 per cent., and putting down the sum, 9.41 per cent. under the latter head, and thus leaving zero for the percentage of albuminoids. This error I am very glad to correct in this place, as well as the misapprehension into which it led me, that the supposed absence of albuminoids indicated the failure to use wheat and barley-malt in the preparation of this food. On the contrary, the constitution of the food shows that both these articles were used, together with bicarbonate of potash, and the Mellin's is a genuine Liebig's food.

Class II.—Liebig's Foods.

	8. Mellin's.	9. Hawley's.	10. Horlick's.	11. Keasbey and Mattison's.	12. Savory and Moore's.	13. Baby Sup No. 1.	14. Baby Sup No. 2.
Water,	5.00	6.60	3.39	27.95	8.34	5.54	11.48
Fat,	0.15	0.61	0.08	None.	0.40	1.28	0.62
Grape-sugar,	44.69	40.57	34.99	36.75	20.41	2.20	2.44
Cane-sugar,[1]	3.51	3.44	12.45	7.58	9.08	11.70	2.48
Starch,	None.	10.97	None.	None.	36.36	61.99	51.95
Soluble carbohydrates,	85.44	76.54	87.20	71.50	44.83	14.35	22.79
Albuminoids,	5.95	5.38	6.71	None.	9.63	9.75	7.92
Cellulose, gum, etc.,	.....	.....	.....	.....	0.44	7.09	5.24
Ash,	1.89	1.50	1.28	0.93	0.89	Undeterm.	1.59

[1] These determinations are probably higher than they should be, owing to the influence of dextrine upon the sugar determinations, but if there is an error, it is of the same amount in every case.

In fact, the percentage of albuminoids in a Liebig's food has not the same relative significance as it has in the case of Class I., or Farinaceous Foods. This point may be best explained by an examination of the analysis of Savory & Moore's Infant Food and the Baby Sups. These are composed of the materials, out of which, by a long and tedious process of conversion, a food like Nos. 8, 9, and 10 is made. This process is as follows: Equal parts of wheat-flour and barley malt, together with a certain amount of wheat-bran added, it is said, for the sake of the adherent phosphates and nitrogenous matter, together with one per cent. of bicarbonate of potash, are mixed with sufficient water to make a thin paste. The mixture is allowed to stand at ordinary temperature for several hours, and then heated to 150°, until the conversion of the starch is completed. It is then strained, and the residue pressed and exhausted with warm water. The extract is evaporated *in vacuo*, at as low a temperature as consistent with rapidity of working, dried at a higher temperature, and, finally, by very skilful, manipulation, brought to a finely pulverulent mass, which does not contain sufficient moisture to cake together, and is a most commendable product of technical skill.

By careful selection of highly albuminous wheat and

excellent barley the best results possible can be obtained. What they are, and whether or no the addition of bran increases the percentages of phosphates and other valuable constituents in the extract, I am not prepared to say. I should have very gladly complied with the wishes of manufacturers of Liebig's foods to investigate these matters for them as a matter of ordinary professional labor, but felt that my candid expressions with regard to this subject would not permit me to do so without laying myself open to the imputation of bias. But these explanations suffice to show that the percentages of albuminoids in Liebig's foods have not the same significance as in other classes of infant's foods. The starch has undergone conversion into dextrine and grape-sugar, which, being soluble, pass into the liquid extract, and are evaporated down and pass into the final product. But only that portion of the albuminous matter which is contained in particles so fine as to pass through the strainers, together with the solid albuminous matter (and this is especially valuable in the nutrition of infants), is found in the final product. This deficiency in total albuminoids therefore is inevitable, and is an evidence of the genuineness of a Liebig's food. To determine how large a proportion of these albuminoids passes into *solution* would be of great value. To this end a mode of analysis should be used for these foods, specially designed for them, and this analysis should give not only the varieties of sugar, the dextrine, and soluble and insoluble albuminoids, but the peculiar kinds of extractive. If the virtue of Liebig's foods resides only in their not containing starch, but its products of transformation, gum and dextrine, together with sufficient bicarbonate of potash to make the reaction of the infant food, like milk, always alkaline, then so tedious and expensive a process would not have to be resorted to in order to obtain a mixture which can be made directly very cheaply. If, on the other hand, the other substances extracted from the grain have an important dietetic value of their own, then the analysis should be directed to ascertain their nature and amount. This has hitherto not been done, nor do we possess the records of physiological experiments bearing expressly upon these points of inquiry. In Savory and Moore's food this process of conversion has not been effected. Neither can it be when the food is prepared according to directions. These are to put one or two tablespoonfuls of the food into a suitable vessel, mix gradually, with two or three tablespoonfuls of boiling water or milk, and cool to the temperature of new milk. The conversion of the 36.36 per cent. of starch cannot be effected so readily. If it be (and it is stated that there is no objection (!) to so doing) heated until it thickens, afterwards removed from the fire and stirred until it become fluid, then a greater amount of starch will be converted than when mixed with boiling water only, but there is no certainty nor probability that, in any case, all the starch will undergo conversion. Neither its composition nor its method of preparation explain why, when this food is prepared with water, the food is equivalent to mother's food in nourishing power, and why, as the advertisement likewise claims, when prepared with milk only, it has twice the strength. It is certainly not to the 36.36 per cent. of starch that it owes this power, nor to the 9.63 per cent. of the albuminoids of wheat and barley. In fact, this large proportion of albuminoids shows how much less of wheat and barley has actually been employed in the preparation of Savory and Moore's food, than should have been employed in order to obtain a genuine Liebig's food. For, in the latter, the fluid extract of the wheat and barley is used, and the residual matter, which is not beneficial but injurious in the nutrition of children, is strained off, so that the solid matter remaining after evaporation represents an amount of wheat and barley originally taken greatly in excess of its own weight. In Savory and Moore's food, the percentage of albuminoids is that corresponding to the sum of the weights of the ground barley malt and wheat originally taken. These are added together, along with the alkaline bicarbonate, and, when prepared for use, the insoluble albuminoids and the useless and irritating particles, which Liebig directed should be strained off, are allowed to remain in the food.

I have spoken thus severely of Savory and Moore's food, because, whilst claiming to be prepared in accordance with Liebig's principles, it actually contravenes them. The following much less ambitious preparations are worthy of more favorable comment:

Baby Sup No. 1 is advertised as an excellent substitute for mother's milk, in case of infants under four months of age. It is a very sweet, partly crushed whole oat-meal, very palatable even before cooking, and dissolving readily in the juices of the mouth. It is prepared from malted oats, and, after the conversion of the starch has gone as far as it is thought it will proceed, the oats are carefully hulled, only a residue of the coat being left in the crack of the grain. The analysis shows the lowered percentage of starch, and the increase of saccharine bodies due to this treatment.

Baby Sup No. 2 consists of wheat flour, malted barley, and bicarbonate of potash, in the proportions given in Liebig's formula. In its dry state the mixture has little taste, but becomes thin, sweet, and palatable on cooking. The analysis gives but a partial result of this change, because the food was cooked only five minutes before the analysis, whilst the directions call for a half hour's cooking. But already much of the starch has been converted into dextrine. These foods are commendable efforts to carry Liebig's views into practice, and it is to be regretted that a certain amount of care and time is required to properly cook them, and, for this reason, they will probably have only a restricted use. In Mellin's, Horlick's, and Hawley's foods this care and time have already been expended by the manufacturer, and experience has shown that few mothers or nurses can or will take so much trouble.

Keasbey and Mattison's Foods.—From the point of view above taken, it is possible to explain a peculiarity in its composition, which I failed at first to understand. This is, that the sample of this food which I examined contained no albuminoids whatever. Its advertisement states that it is an extract prepared from malted grain, dextrine, alkaline phosphates, etc., and that it is perfectly free from starch. It does not resemble the other preparations of Liebig's foods in the market, being, unlike them, a thick liquid, resembling, both in taste and appearance, some variety of molasses or syrup. My first explanation of the entire absence of albuminoids was, that no grain was used in its preparation. This is not the case. The food is not strictly a Liebig's food, but in reality a neutralized extract of malted barley. The ground malt is extracted with hot water, the liquid strained, evaporated *in vacuo*, and neutralized with bicarbonate of potash. There is no question that the albuminoids did not pass the sieve, for I could neither determine them by ordinary methods, nor get the reaction for nitrogen by the most severe tests. But, as before stated, there must be present certain extractives, and the analysis should be directed to finding them, and thus seek to explain the undoubted benefits frequently conferred by the use of this food.

Before concluding with regard to Liebig's foods, I desire to say a few words concerning the percentages of dextrine and cane-sugar reported for these foods. The former would be nearly that which would correspond to the difference between the amount of soluble

carbohydrates and the sum total of grape-sugar and cane-sugar. But it is not put down in the analysis, because it was not directly determined, and I did not know how much soluble matter of other kinds, possibly soluble albuminoids and other extractive matter of great dietetic value, might possibly be thus erroneously set down as dextrine. The percentages of cane-sugar are not strictly correct, because the presence of dextrine somewhat raises the results obtained, and there is no method, so far as I am aware, of making a satisfactory determination of cane-sugar and grape-sugar and dextrine in a mixture of the three bodies. But the method applied was the same in every instance, so that, besides the cane-sugar proper which is derived from the cereal used, the added percentage due to the error arising from the presence of dextrine would be nearly the same in every sample analyzed. The investigation of this problem should also come into the complete analyses of these foods, as well as the other matters spoken of hitherto. Scheibler, indeed, has indicated a method of detecting dextrine when mingled with cane-sugar in an amount not exceeding 3 per cent.; but in these cases we have, as in Mellin's food, no less than 37 per cent. of dextrine, and 44.69 per cent. of grape-sugar as well, the cane-sugar itself being comparatively insignificant. His method is of no value for such cases.

Class III. Milk Foods.

	15. Nestlé.	16. Anglo-Swiss.	17. Gerber's.	18. Am'can-Swiss.
Water,	4.72	6.54	6.78	5.68
Fat,	1.91	2.72	2.21	6.81
Grape-sugar and milk-sugar,	6.02	23.29	6.06	5.78
Cane-sugar,	32.93	21.40	30.50	36.43
Starch,	40.10	34.55	38.48	30.85
Soluble carbohydrates,	44.88	46 43	44.76	45.35
Albuminoids,	8.23	10.26	9.56	10.54
Ash,	1.59	1.20	1.21	1.21

These articles have been prepared in order to supply a food which should contain the constituents of milk to a certain extent, and yet should be free from the objections to which condensed milk is open. The attempt was first made by H. Nestlé, in Vevey, Switzerland, but at the present time many milk factories are in existence, including one in our country at Little Falls, in New York, under the management of Dr. N. Gerber. All of these milk foods consist of cereals specially prepared in combination with milk. The preparation of the Anglo-Swiss milk food is stated to be as follows: 20 parts of Russian wheat flour and 20 parts of oatmeal are made into a dough and baked. The biscuit is then ground fine, mixed with 60 per cent. of condensed milk, dried by a slow heat at 120° to 130°, ground, and sufficient wheat gluten added to bring up the percentage of albuminoids to the same amount as that present in human milk. It is evident that apart from giving a general idea of the method of manufacture, this statement cannot be regarded as correct, inasmuch as the percentage of fat in the Anglo-Swiss milk food analyzed is much less than that which would be imparted by 60 per cent. of condensed milk, The percentage of albuminoids likewise makes it doubtful whether any albuminoids in addition to those present in the milk and flour, have been added in the form of specially prepared wheat gluten.

According to Dr. N. Gerber (*Milk Analysis*, p. 70), the various milk foods in the market vary in composition as follows:

		Average.
Water,	5.0 to 10 per cent.	7.50
Salts,	1.5 " 3 "	2.25
Fat,	4.0 " 7 "	5.50
Albumen,	9.5 to 18 per cent.	13.25
Soluble carbohydrates,	35.0 " 55 "	45.00
Insoluble "	15.0 " 35 "	25.00
Cellulose,	0.5 " 1 "	0.75

It will be noted that Nestlé's food departs further from the average than any of the other preparations, and the American-Swiss approaches most nearly. The percentage of fat in the latter is much larger than in the other preparations, and the percentage of albuminoids is likewise the greatest. On preparing these various brands, the Nestlé, Anglo-Swiss, and Gerber's were very palatable and delicate in their flavor, more so than the American-Swiss, which had a slight rancidity connected, no doubt, with the large percentage of fat and fatty acids. Under the microscope the various milk-foods had a similar appearance, exhibiting agglomerations of starch granules and globules of milk. They all gave the starch and dextrine reaction with iodine, the reaction for dextrine being stronger in the Gerber than in the Anglo-Swiss. All had a faintly acid reaction except Nestlé's, which was slightly alkaline.

All of them have the same points in their favor—a high percentage of albuminoids, fats, and salts, this being especially true of the American-Swiss. The conversion of the starchy matters into dextrine by previous baking gives to this class of infant foods the advantages of that class of prepared cereal, which have been rendered easily assimilated by a process of previous torrefaction. The addition thereto of condensed milk has both advantages and disadvantages. The advantages are that the condensed milk is milk in a pure and safe form. Instead of being coagulated in large, cheesy masses in the child's stomach as would be liable to be the case if the condensed milk, after thinning with water, were given alone to the infant, the admixture of dextrine and torrefied flour keeps the caseine divided, and causes it to form in small flakes more nearly analogous to those forming from woman's milk. The condensed milk likewise adds a noteworthy percentage of fat, which is conspicuously absent from the other infant foods. It also adds a certain amount of milk-sugar and increases the percentage of albuminoids and valuable saline matters, more especially the phosphates. The principal disadvantage is, that condensed milk is preserved with the aid of cane-sugar, its analysis being as follows:

Water,	20.0 to 30.0	per cent.
Salt,	1.5 " 3.0	"
Fat,	8.8 " 12.0	"
Albuminoids,	10.0 " 13.0	"
Milk-sugar,	10.0 " 15.0	"
Cane-sugar,	30.0 " 45.0	"

Cane-sugar, therefore, being relatively by far the largest constituent, there soon arrives a point in the manufacture of milk food when the addition of condensed milk must cease. Otherwise the percentage of cane-sugar, which like other carbohydrates is very objectionable when it takes the place of a proper amount of albuminoids, would become excessive, and indigestion thereby be induced in the infant using such food. The remedy, it appears to me, would be found by using a condensed milk preserved without the aid of cane-sugar, and since this can now be successfully effected by means of Appert's method, the preparation of a milk food not open to the above objection should be soon satisfactorily accomplished. In that case we should have an infant's food with a very high percentage of albuminoids, fats, and salts; and a low percentage of carbohydrates. The sugar would be present in the form of milk-sugar derived from the milk, and as grape-sugar derived by a process of torrefaction from

the meal. The last in its turn would not have to be present in larger amounts than what are requisite to supply the starch and dextrine, which are of use to prevent coagulation of the caseine in large masses.

Condensed and Preserved Milk.

	Condensed (mean of 41).	Condensed (diluted).	Preserved Alpine.	Preserved Amer.-Swiss.	Preserved Am.-Swiss (diluted).
Water, . .	30.34	88.39	58.57	59.21	87.78
Fat, . . .	12.10	2.82	13.21	11.55	3.46
Milk-sugar,	16.62	2.77	15.29	13.04	3.91
Cane-sugar,	22.26	37.1			
Albuminoids,	16.07	2.68	11.36	14.10	4.23
Ash, . . .	2.61	0.43	1.78	2.09	0.62

It will be seen that when the condensed milk is diluted until its percentage of water is about the same as in human milk, it has relatively too little fat and too little sugar (the larger portion of that also being cane-sugar) as compared with human milk. It has also too much albuminoids and ash.

Preserved milk is the result of scientific investigation applied to this subject, and its manufacture marks a great advance in the technique of the milk industry. The product, when diluted, has no cane-sugar (an abnormal constituent of milk), and the ratio of its constituents is similar to ordinary cow's milk. It differs, of course, from human milk, and requires the addition of milk-sugar, fat, and of some bland inert attenuant, like torrefied wheat or barley-flour, to overcome the general objection to any form of cow's milk as a substitute for woman's. Experiments in this direction are on foot, and will probably result in supplying a milk food not open to some of the objections urged against previous preparations of this class. The keeping qualities of the preserved milk are likewise very remarkable; its introduction is a great public boon, and cannot fail to exert a powerful influence upon the future of urban milk-supply, and the alimentation of infants.

Conclusions.—I have been frequently asked why I do not publish my own opinion as to the best of the various foods now in use. To do so would be very unwise for many reasons. But I have endeavored to do what I have regarded as of far more importance than this, which is to praise or blame just as the information afforded by physical and microscopic examinations and chemical analysis demanded, without partiality or bias, and seek out and state the principles upon which, as it appeared to me, the dietetic value of these articles of infant food depended.

To summarize the points which I have endeavored to establish:

1. Cow's is in no sense a substitute for woman's milk.

2. Attenuation with water alone is inadequate, and chemical metamorphosis, or, mechanically, the addition of some inert attenuant is required, in order to permit of the ready digestibility of cow's milk by infants.

2. The utility of manufactured infant's food is to act as such attenuants, and as such they take the place of the simple barley and oatmeal water, the sugar, cream, baked cracker, arrowroot, etc., etc., used in former times.

4. The results of both chemical and physiological analysis are opposed to any but a sparing use of preparations containing large percentages of starch.

5. It is eminently probable that besides acting as attenuants, the matters extracted in the preparation of barley and oatmeal water, and still more the soluble albuminoid extractives obtained at ordinary temperatures (whereby coagulation is prevented), by Liebig's process, have a great independent value of their own. For this reason, instead of employing starch, gum, gelatine, sugar, ect., the use of a natural cereal extractive, containing saccharine and gummy matters and soluble albuminoids as well, such as our great and inspired teacher Liebig himself advocated, is in accordance with the developments of science since his time.

6. The use of a food made up of equal parts of milk, cream, lime-water, and weak arrowroot water, as practised for years by the late Dr. J. Forsyth Meigs, and recently advocated by his son, Dr. Arthur V. Meigs, is sustained by theory, analysis, and practice. It provides for the increase of fat to an amount comparable to that contained in human milk. It adds alkali to permanent reaction, and to convert caseine into soluble albuminates. It adds a little bland attenuant. And if, in addition, the amount of milk-sugar were raised, and instead of arrowroot water, barley or oatmeal water were substituted, as the case demanded, it would approach, it appears to me, still more nearly to the conditions required.

7. The perfect solution of the present problem is to be found in the modification of cow's milk by chemical processes, so as to make it physiologically equivalent to human milk. The nature of these processes and the results to be obtained, are at present so nearly wrought out, that there is good ground for believing that such a solution of this problem is not far distant in the future.

ORIGINAL ARTICLES.

A CONDENSED TABULAR REPORT OF 24 CASES OF HEMORRHAGIC MALARIAL FEVER,

OCCURRING DURING THE PERIOD FROM 1867 TO 1882, INCLUSIVE.

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			Color.		Sex.		Result.		Quin'e.					Recov.		Died	
	Case.	Approximate Age.	White.	Black.	Male.	Female.	Recovered.	Died.	Taken.	Not taken.	Primary.	Secondary.	Relapsed.	With quinine.	Without quin'e.	With quinine.	Without quin'e.
	1	40	1			1	1			1	1				1		
	2	18	1			1		1	1		1					1	
	3	38	½	½	1		1		1		1			1			
	4	25	1		1			1	1		1					1	
	5	40	1			1	1			1		1			1		
	6	19	1			1	1		1		1			1			
	7	40	1		1			1	1		1					1	
	8	17	1		1			1	1		1					1	
	9	8	1			1	1		1		1			1			
	10	11	1			1	1		1		1			1			
	11	10	1		1		1			1	1		1		1		
	12	10	1		1		1			1	1				1		
	13	10	1		1			1	1		1					1	
	14	55	1		1		1			1	1				1		
	15	35	1		1		1		1		1			1			
	16	3		1	1		1			1	1				1		
	17	5	1			1	1		1		1			1			
	18	26	1			1	1		1		1			1			
Total,	18		16	2	10	8	13	5	12	6	17	1	1	7	6	5	0

Remarks.—All the eighteen cases presented in the above synopsis were of the type referred to in

Dr. James Tyson's paper as *malignant hæmaturia*, called in Alabama *hemorrhagic malarial fever*, and occurred in the writer's practice from 1867 to 1882, inclusive. They exclude all cases of hæmaturia, of hæmatinuria, and of melanuria not attended by the icterode discoloration and the gastric, intestinal, nervous, circulatory, and respiratory disturbances which belong to the make-up of true hemorrhagic malarial fever. In its treatment, every expedient deemed judicious to produce cutaneous action and vascular and nervous reaction and equilibration was unceasingly urged, particularly so in the early stages. Where there was a subjective sensation of great and oppressive heat, with great attendant jactitation and suspirious breathing, the assiduous wiping over of the whole surface of the body in rapid succession with thin towels wrung out of fresh cold water, or filled with pounded ice, was often attended with the very happiest effect and greatest relief. This measure never failed greatly to diminish, and often quite dispelled the yellowness of the surface. Sometimes towels wrung out of hot water were useful, and sometimes the hot and the cold were applied alternately. In the very early stages, perspiration was sometimes secured by hot air, or by bottles filled with hot water introduced under the bedclothes. Almost invariably, when the sweating became free the hemorrhage ceased, and the whole condition improved.

In nearly all the cases, to improve the condition of the digestive tract, from 1 to 4 grs. calomel, and an equal quantity of bicarb. soda, triturated thoroughly with 1 to 2 grs. of loaf sugar, were placed on the tongue to be swallowed with a tablespoonful or two of ice-water, and this was repeated every 2 to 4 hours, until about four such doses had been taken. About four hours after the last of these doses, if their action had not reached sufficiently far down the bowels to be met by enemata of hot soap-water, small quantities of solution of Epsom salts or other saline were given and repeated until the bowels were satisfactorily cleansed. This was found to be the most reliable treatment for the terrible nausea and vomiting.

Henceforth, everything that tended to disturb the stomach, or to increase its existing disturbance, was found to be the worst barrier to success, and everything that tended to quiet the stomach, or to maintain its quiescence, was the surest guide to recovery.

Here lies the point of greatest resemblance between the fever of which we are speaking and yellow fever, and the true reason, perhaps, why quinine is so dangerous and so uncertain a remedy. Some of the cases in the table which died *with quinine* might, possibly, have lived without it, for they seemed to be doing reasonably well until a dose of quinine, given with intent of aiding their condition, seemed to have the contrary effect, and to determine an unfavorable result. In Case 11, quinine had been given to the amount of 55 grains during the twenty-four hours next preceding the attack, and the quinine was continued both by the mouth and hypodermically after the seizure, until ceaseless vomiting and forming abscesses forced its abandonment. The case remained apparently hopeless many days after the quinine was stopped, and hence in the table this case is included with those in the curative treatment of which quinine is marked "not taken." In Case 13, the white boy of ten years of age had a chill (ordinary as was supposed) one morning at school; went home with fever at 12 o'clock; took quinine freely during evening and early night, and before daylight took the hæmaturic chill. In this case, if the quinine did not do harm, it surely did no good.

Pellets of ice were allowed to be swallowed or to dissolve in the mouth in all cases *ad libitum;* and in three of the cases, with the view of allaying the sickness of stomach as well as to check the hemorrhage, recourse was had to sugar of lead. In one of these cases only three grains were given and the most given to either one of them was nine grains. The nausea and the hemorrhage were greatly benefited in all the three cases, but all of the three had protracted spells of lead-colic resulting. To soothe the kidneys and to guard against the suppression of their secretion, fluid extract of buchu in f℥j to f℥ij doses, sometimes with and sometimes without sweet spirits of nitre, was frequently given in a little ice water. Fowler's solution is nauseating and was therefore always avoided, but a very small pill containing from one-twelfth to one-eighth grain of powdered white arsenic and a little powdered extract of liquorice was often given at intervals of four hours to six hours. I resorted to the hypodermic use of quinine in only one of these cases, and I am disposed to give the method a farther trial.

I do not think that temperament has any relation to the disease.

It will be seen from the table that:

In the 18 cases there were 13 recoveries, or 72.22+ per cent.

In the 18 cases there were 5 deaths, or 27.77+ per cent.

In the 12 cases with quinine 7 recoveries, or 58.33+ per cent.

In the 12 cases with quinine 5 deaths, or 41.66+ per cent.

In the 6 cases without quinine 6 recoveries, or 100 per cent.

In the 6 cases without quinine 0 death, or 0 per cent.

Muriated tincture of iron, whenever it could be risked on the stomach, was thought to be indicated and was freely given whenever well retained. It was a staple in the treatment of convalescents.

Below will be found a tabulated statement of six cases of hemorrhagic malarial fever seen in consultation, or by request of attending physicians, during the period from 1867 to 1882, inclusive. In these cases, as a rule, calomel was used in larger doses, and quinine and spirits of turpentine boldly and freely given. It will be seen that:

The six cases give five deaths, equal 83.344 per cent.

The six cases give one recovery, equal 16.664 per cent.

	Cases.	Approximate Age.	White.	Male.	Female.	Recovered.	Died.	Quinine taken.	Primary.	Recovered with Quinine.	Died with Quinine.
	1	28	1	1			1	1	1		1
	2	28	1	1			1	1	1		1
	3	18	1	1			1	1	1		1
	4	43	1	1			1	1	1		1
	5	14	1		1	1		1	1	1	
	6	15	1	1			1	1	1		1
Total, .	6		6	5	1	1	5	6	6	1	5

RIGIDITY OF THE ANAL MUSCLES A CAUSE OF LACERATION OF THE PERINEUM IN LABOR.

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EVERY thoughtful practitioner has, no doubt, racked his brain over the perplexing question of preventing laceration of the perineum. The question is touched or reconnoitred by every author on obstetrics, but it can hardly be said that the subject has been *handled*—its etiology and prophylaxis *fathomed*. There are still many mooted points, the discussion of which is far from being closed. There are also questions which are quite pertinent to the subject which have as yet received little or no attention, and one of these overlooked or neglected topics is the subject of this paper.

"Rigidity of the perineum" is a much-abused phrase. It is very frequently applied to a condition of defective distensibility of the perineum proper, or even to diminutive size of the vaginal outlet from a want of development of the structures which surround it. Such a perineum may, in one sense, be *rigid*, but the term should more strictly be applied only to those perinei which are anatomically normal and capable of being distended to a degree consistent with the passage of the normal child at term, but are rendered *rigid* and *undilatable* by a hyperæsthesia of the muscles which form them.

The course to be pursued by the obstetrician in each case is governed by "what's the matter." The causes of laceration or the conditions which tend to bring it about are so various and distinct that no general discussion of the subject would be satisfactory. A classification of the *causes* has, so far as I know, never been made or attempted, but the books are full of suggestions and methods as to how to prevent the lacerations, but scarcely a word can be found bearing upon the primary conditions which render these directions pertinent. The infinite variety of manœuvres recommended shows how much demand there is for light on the subject.

Having had some very embarrassing experiences with perineal ruptures in my early midwifery practice, and especially with primiparæ, I was led to review again the literature of the subject.

There is a certain percentage of cases in which a rupture may be regarded as *inevitable*, even in the hands of the most skilful attendant. The following are the most important of the conditions in which these inevitable lacerations occur: Non-distensibility from lack of proper development in the perineal structures; incompressibility or excessive growth of the child's head; the inelastic state of the vaginal and perineal tissues in females who marry late in life; the narrow pubic arch, constituting the form denominated the "male pelvis;" unnatural positions and presentations of the child; and that peculiar condition of the muscular fibres frequently met with in delicate females, rendering them unable to bear very moderate force without rupture, or that other, possibly similar anatomical condition, bordering on a fatty degeneration of the pelvic muscular tissues, found in women suffering from chronic congestions of these parts, and in those who indulge too freely in stimulating foods and drinks, and especially in the excessive use of malt liquors.

A careful study of the peculiarities of each case, however, and a judicious application of the proper measures at the proper time, may restrict the number of unavoidable lacerations to a much smaller percentage than is at present done. If reliable statistics could be had concerning the frequency of serious lacerations of the perineum, and if the suffering and danger thereby entailed could be duly appreciated, the physician would use every endeavor to honestly cheat the gynecologist by preventing, as far as possible, not only these serious injuries, but the less important ones as well, and the midwife, too often grossly ignorant, would find her services in poor demand.

In my experience, it is the truly rigid perineum that is the most likely to be extensively torn. Everything may be apparently going on well, and the perineum promise to distend easily and amply, but just at the critical moment, when the head presses hard upon the pelvic floor, the muscles contract and the whole structure suddenly gives way.

This contraction occurs more or less regularly, though not very strongly, with each labor-pain, but it reaches its climax only when the head escapes from the cavity of the pelvis and bears down upon the sensitive muscular structures guarding the outlet to the parturient canal.

Let us see what the most important of these structures are. It is evident at a glance that the small, weak muscles of the perineum proper, though they are the ones lacerated, can offer but slight contractile resistance; and moreover, they are quite elastic in the great majority of instances, so that if they were the only obstacles to overcome, the muscular fibres would readily relax, and the fibrous network protect the muscle, while it could retreat as the head advanced. But there is a powerful muscle behind and above these weaker ones which is the *causus mali*, preventing the perineum proper from retreating, and accountable for its destruction. The levator ani, the main plank in the floor, is the offender. By its attachments, its action is necessarily as an elevator not only of the anus, but of the whole pelvic floor. By the intimate interlacement of its fibres with those of the transversus

perinei and sphincter vaginæ, relaxation of the latter muscles produces little if any enlargement of the vaginal opening.

That other anatomical *sine qua non*, the sphincter ani, plays also a very important *role*. Its comparatively stationary attachment being posterior, its contraction causes the perineum to recede, while it is itself drawn upward by the levator ani.

Now, in order that the perineum may most certainly avoid injury by the escaping head, it must retreat downward and somewhat forward. This it easily does when it is distensible, provided the levator ani and sphincter ani remain in an uncontracted state.

How can we prevent lacerations depending upon a rigidity of these anal muscles? Certainly not by waiting till the perineum *begins to bulge*, and then carefully regulating the amount of strain upon it. Where this method would succeed, there would be little necessity for "regulating" anything. In the majority of cases where this method is used with good results, and no preliminary measures employed, the parts would probably go through the last step of the second stage of labor unscathed, because regulating the pressure would have little effect upon the muscular contraction if that were sufficiently strong to render laceration "imminent," as such cases have been happily termed.

When the *bulging* has begun, the time for prophylactic measures in such cases is past. No amount of support to the perineal structures will counteract the pressure of the advancing head when the pains are strong. The sudden, spasmodic contraction of the anal muscles exerts a counter-pressure on the presenting part, drawing the perineum over the prominent vertex, and laceration is certain to accompany the escape of the head.

The directions for supporting the perineum, guiding the head upward, allowing head to pass during an intermission of the pain, etc., are all very excellent in their place, and should be carefully studied and practised, but their *place* is subsequent to the preparation of the parts for the emergency they are expected to meet. The various "methods" apply rather to the crisis, when it is too late for them to be of any avail in the class of cases now under consideration.

But the plan herein described, the writer is convinced, will be found efficient in the cases of rigidity of the anal muscles, except in those anomalous, precipitate labors which are occasionally so unexpected and brief as to even preclude the use of *any* preventive measures.

An attempt to solve the problem is described by Mr. Duke in the *British Medical Journal* of March 10, 1883. His method, however, though approaching the real cause of the difficulty, does not reach it, and he, like other writers on this mooted point, does not attempt to classify his cases and point out the essential indications for using his particular method. His theory of "tiring out" the perineum, and his method of accomplishing it, have probably occurred to many others, and doubtless have been put in practice, but that his plan would succeed in those cases where the muscular structures of the pelvic floor were hypersensitive, I very much doubt. His procedure is briefly as follows, and obviously only affects the perineum proper: At that period in the second stage of labor when the head has well entered the pelvic cavity, and the pains effective, during the pain he draws the perineum steadily backward with the fingers inserted into the vagina. Intermitting his traction at the cessation of each pain, he repeats the process till he exhausts the muscles, and sufficient dilatation is produced to allow the head to pass readily.

If the muscles in the anterior portion of the pelvic floor were alone at fault, no doubt the above method would overcome the difficulty, but that such cases are frequent or serious I am unwilling to admit.

The "tiring out" process must be applied to all the muscular structures obstructing the passage, and must be applied in the proper direction.

The hyperæsthetic state of the muscles may be tested, by, in a manner, simulating the action of the child's head upon them. When the labor has well advanced, and the head so far descended as to be well engaged and is making satisfactory progress, two fingers well lubricated with carbolated vaseline are hooked into the vagina, and during the pain the perineum pressed directly downward, separating the fingers as far as possible so as to distribute the pressure and act upon the posterior as well as lateral fibres of the levator ani. If there is marked "irritability" of this muscle, it will be felt to become more or less rigid as the pressure is increased, and relaxed as the pressure is withdrawn. If the test shows the presence of the hyperæsthetic state, the following procedure may be employed to "prepare" the parts for the final act: At the beginning of each pain the two fingers are introduced as before, and the perineum drawn *downward* gently at first, but gradually more strongly as the pain increases, and lessening the traction as the pain subsides. This is repeated till but little force is needed to dilate the vaginal orifice sufficiently to admit three and then all four fingers with ease. By this time the anus is patulous and the sphincter ani exhausted. Drawing the perineum backward leaves this latter muscle in its pristine tonicity; and the levator in the greater part unexhausted. Thus the sphincter is ready to draw the perineum violently backward, and the powerful action of the levator draws it upward just at the moment when the whole pelvic floor should be in a state of complete relaxation.

In cases where the muscles are excessively hyperæsthetic the thumb may be used in conjunction with the fingers, introducing it into the rectum after the sphincter has become relaxed. Mock modesty under such circumstances is reprehensible. There is nothing indelicate in this procedure when the welfare of the woman demands that nothing should be left undone which promises her security against injury. By using the thumb in this way, separate segments of the levator may be successively acted upon, and the exhaustion rendered more complete.

This "tiring out" of the anal muscles causes no apparent increase in the woman's sufferings, being done during the pains. The manipulations are carried out at the time when she is begging the phy-

sician to help her, and when the pains are strong she will hardly seem aware that he *is* "helping" her, even when he has all the fingers in the vagina and the thumb in the rectum, firmly drawing downward.

After the muscles are thus exhausted, labor should be completed as speedily as possible. If the pains are becoming weak and inefficient, the forceps may be applied at once, but if there are good pains and everything favorable for a speedy completion of the birth, the best way to keep the muscles relaxed, and also to excite the pains to still greater efficiency, is to keep the hand in the vagina, thus distending the perineum, and just before each pain begins, insinuate a finger between the head and the bony pelvis at the point where the pressure is greatest, and as the pain comes on, indent the cranial bone at that point, and slowly withdraw the finger, and permit the head to descend. Repeating this process with each pain, the head is teased along until it escapes from its osseous vise. At the same time it is guided in the proper changes of flexion and rotation, the pains are excited, and the labor hastened toward completion, and the attendant is not merely bustling about with a pretense of doing something, but is, in fact, *helping* the sufferer.

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MEDICAL PROGRESS.

THE YELLOW-FEVER FUNGUS.—About the time that Koch first published his discovery of the bacillus-tuberculosis, CARMONA, of Mexico, published the results of his investigations as to the germ-origin of yellow fever (*Revista di Medicina y Cirugia*, Feb. and March, 1882). His paper does not seem to have excited the same interest as did that of Koch; indeed, so far as we can ascertain, it has been published in no other than the Spanish language. As to his methods of investigation and their reliability, we cannot, at present, judge, but they should at least be made known, so that competent mycologists can repeat and either confirm or refute his statements.

Carmona found certain similar bodies in the blood, urine, and vomit of yellow-fever patients. The general element, wanting in none of these substances, was a granular matter, only seen with a microscope of 1500 diameters, very abundant, ovoid, and slightly yellow, which appeared to have filaments similar to vibrating ciliæ, and having peculiar movements, with a tendency to repeat these again and again. At rare intervals, it curls itself in its greater diameter, and generally arranges itself on its side, gradually approximating the extremities until they meet; then regains its ovoid form, which is similar to that of the prostate gland. These granulations are capable of increasing or maturing, and, under special conditions, gradually lose their first movement, and then unroll themselves into *spherical* bodies of yellow color, uniform aspect and dimensions, eight or ten times larger than the first granulations. These are from 5–12 mmm. in diameter. These large granulations were those which first attracted attention in the urine of the first patients examined, and since found in the cellular tissues, serum of blisters, and other points of the organism. There were in the urine threads, evidently *mycelia*. Some are so large as to cover the whole field of view; others smaller, and, besides, there were abundant fragments of various forms and dimensions. Some were more delicate, and of a cellular aspect; others more compact and larger, of a brilliant yellow color, and of fatty aspect; some of a more reddish color; others emerald green; still others, but much more rare, of a blue color. Their diameters varied from 2–20 mmm. Cells were frequently encountered, completely empty, of rounded or pyriform shape and variable dimensions. Many of these cells were not entirely empty, but contained a red or yellow granular material, similar to the points noticed in the goldstone. Sometimes they were found conglomerated, with the same aspect as already described, moving freely, and not restrained by the enveloping cellular tissue. Finally, in the same urine were found black bodies of different forms and dimensions, more or less irregularly spherical, others ovoid, and some quite lengthened, as though a mycelial tube had become entirely carbonized.

These different elements were found in all the specimens of urine examined, both in the fatal cases, and in those which recovered. Their abundance in the urine was in direct proportion to the severity of the attack. If the specimen of urine is set away for a few days, there is no change of form in the mycelia, the empty cells, or red bodies; but the primitive granulations and the spherical yellow cells undergo the following modifications: In proportion as the urine evaporated, there was found a great quantity of granular elements, not visible when swimming in the liquid, and appearing as yellowish points of fatty aspect; in some cases appearing as the small points unrolling and being transformed into spherical yellow cells. Specimens were found in which the gradual transition from the elemental granules to the spherical yellow cells was clearly established. These, in turn, underwent different transformations: some underwent the process of gradual regeneration and separation into different fragments. (This was seen once.) In the majority of cases, the cells were gradually involved in a yellow fluid, entirely similar to that contained in the interior; but it did not appear that it transuded from these cells. As this phenomenon was repeated in a large number of cellular elements there were found, from time to time, *lakes* of this protoplasmic substance, in which the primitive cells floated. The contents of these cells are granular, and in one or two points of the circumference there appeared certain rounded elevations, which increased and unfolded into mycelial threads. These threads unfolded by preference towards the border of the object cover-glass, as though seeking the influence of the air, and, in some instances, forming an inextricable web or network with the newly formed threads, which presented an aspect analogous to that seen in certain hedges formed by rods. In the centre of the preparation, the granular elements, as well as the unfolded yellow cells, had a great tendency to collect together, forming more or less vigorous filaments. In the protoplasmic lakes there were frequently seen fat crystals, some of which appeared to be of cholesterine, others of hippuric acid, and still others of tyrosin needles grouped in spherical masses, and forming irregular crosses. These same elements were encountered in the vomited matter, having a white or greenish-yellow color, being especially abundant in large mycelial threads. In some cases, there were ovoid cells, which appeared to be due to the alcoholic fermentation described by Pasteur. In these liquids, the spherical, yellow and elementary granules suffered the same changes as already noticed in the urine. The black-vomit sediment appeared to be formed for the greater part of blackened mycelial threads, and other bodies of different forms and sizes, also black. There were also present yellow or greenish threads and elemental granules.

In one specimen of blood was found a reddish liquid, with coagula in the bottom. No blood-globules could be found; but the granules were very abundant, with very rapid movement, many of them uniting by their slender extremities, and forming small stars. The reddish bodies and mycelial threads were also found. After allowing this liquid to stand for a day or two, the following phenomena were noted: The coloring matter of the blood was arranged along the borders of the preparation, and the entire red field was furrowed in various directions by brilliant yellow threads, the color of which contrasted strongly with the red fluid.

If a portion of the urine be allowed to evaporate spontaneously, and the residue be examined microscopically, the protoplasmic substance, containing abundant spherical yellow granulations, mycelial tubes, and crystals of cholesterine and tyrosin, before mentioned, are seen. The free extremities of many of the mycelial threads were gradually dilated, somewhat resembling the extremity of the olfactory bulb. These dilated extremities Carmona calls *oögonos*, and they measured from 10–60 mmm.

If now a drop of distilled water be placed upon this residue, sufficient to bathe the cells, there will be seen an immense quantity of small, ovoid, slightly yellow granules, with their peculiar movements, and a tendency to unite, laterally, two together, by their small extremities. In a word, these granules are entirely similar to those already described as existing in all the liquids of persons having yellow fever. There is, then, a complete identity between these zoospores found in the different tissues and organisms, some being simply developed forms of others. To this fungus Carmona gives the name *peronospera lutea*, adopting Bertillon's classification of fungi.

These bodies were found in the urine, serum of vesicles, in the cellular, hepatic, and renal tissues, as endospores; in the blood as zoospores.

EXCISION OF HARD CHANCRE.—PROF. LASSAR has come (*Berliner klin. Wochen.*, No. 23) to the conclusion that excision of a hard chancre is an operation which ought to be largely practised. He argues that it can do no harm, that it replaces an unhealthy sore by a healthy, clean wound, and thus offers a chance of preventing the general infection of the system. It is generally taught, however, and we believe truly taught, that at the time of the formation of a hard sore the nearest lymphatic glands are already involved and infected. The eradication of the disease would not, therefore, be possible by the excision of the open sore; just as it would be useless to excise an epithelioma when the glands had already become affected. The question whether it would not be a wise thing to remove any continuing source of infection of the system no doubt arises; and should it be raised, the excision of a chancre is, after all, but a small affair.—*Med. Times and Gaz.*, June 23, 1883.

TUMOR AND FISTULA OF THE UMBILICUS.—DR. TILLMANNS, of Leipzig, reports in the *Deutsche Zeitschr. für Chir.*, Band xviii., the following case, which he believes to be unique, of congenital prolapse of gastric mucous membrane through the umbilical ring. The patient was a lad, aged 13, who presented just over the navel a tumor about the size of a walnut, and covered by deep red mucous membrane. This growth seemed to be attached to the umbilicus by a very thin pedicle. It was irreducible, and its size remained uninfluenced by coughing or by firm manual pressure over the abdomen. From the mucous surface of this tumor there was a secretion, very abundant on digital examination and after each meal, of a turbid and very viscid fluid having an acid reaction, and possessing the chemical and physiological characters of the secretion of the gastric glands. The epidermis of the skin around the tumor was macerated, and, as it were, digested by the action of this discharge. No visible orifice could be discovered on the surface of the tumor, and there was no history of any portion of fluid food or of fecal matter having ever been seen there. The tumor was first observed on the separation of the stump of the umbilical cord on the sixth day after birth. The midwife, in tying the cord, noticed that it was unusually thick near its fœtal attachment. The growth increased slowly in size for about nine years, and then remained stationary. Dr. Tillmanns diagnosed this condition as one of irreducible prolapse of gastric mucous membrane, connected with the stomach by a thin and no longer permeable pedicle. Chloroform having been administered to the patient, the tumor was removed by the knife. No bad symptoms followed the operation, and the lad was soon discharged. The diagnosis was confirmed by microscopical examination of the tumor, which was found to be made up of the different coats of the stomach. The central portion was composed of the serous, subserous, and muscular layers, whilst the outer covering was formed by the mucous and submucous layers. The form of an abundant glandular element indicated that this prolapse had taken place from the pyloric extremity of the stomach. This, Dr. Tillmanns states, had evidently been a case of congenital umbilical rupture containing a gastric diverticulum, a portion of which had been constricted by the ligature applied by the midwife to the umbilical cord, and had thus been cut off, leaving an exposed mucous surface. The pedicle, it is supposed, had been gradually reduced to a very thin cord by the pressure of the margins of the umbilical ring. Dr. Tillmanns has failed in finding any report of an analogous case. In all other cases that have been recorded of prolapse of mucous membrane through the umbilical ring, the protruded part had been derived either from the small intestine or from a patent urachus. This paper concludes with an interesting analysis of recorded cases of such pathological conditions of the umbilicus, as are due to persistence of the vitello-intestinal duct and of the urachus.—*London Med. Record*, June 15, 1883.

COLUTEA ARBORESCENS.—DR. CAMPARDON has recently made experiments with the *Colutea arborescens*, or European (bastard, or false) senna, with a view of determining its therapeutic properties. He used pills containing gr. jss each of extract of colutea and powdered colutea. In a second series he replaced certain purgative pills containing aloes, colocynth, and other drastics by gr. jss each of extract of colutea and extract of colutea powder, for the reason that the rejected drugs gave rise to painful gripings; some of them also producing congestion of the rectal veins, and hemorrhoids. He desired to find a pill which would act regularly and surely in cases of habitual constipation. Six subjects of habitual constipation took from one to four of the pills during the last meal of the day. In all cases the purgative effect was certain, griping being produced in a small number of cases. The pills were used in other cases, sometimes with good results, sometimes with none. In 46 cases, however, purgative effects were produced in 16 only, with a dose of one to four pills. He then used pills composed of extract of colutea and extract of rhapontic rhubarb, āā gr. jss, in some cases āā gr. ij. The patients experimented on, with three or four exceptions, had no colicky pains and always had more or less abundant evacuations. In all, 36 patients took these pills in doses of one to two. One case, however, found it necessary to take six.

The pills should be taken during the last meal of the day with the first mouthful of food. Other preparations than the pills are too disagreeable to be prescribed.—*Bulletin Gèn. de Thérap.*, May 30, 1883.

MELÆNA NEONATORUM.—DR. EPSTEIN, of Prague, discusses this subject (*Allgem. Wien. Med. Zeit.*, No. 49, 1882), and points out that the occurrence of hemorrhage from the stomach and intestines of new-born children is by no means uncommon. He considers that a distinct disposition to hemorrhage from various organs must be recognized as belonging to the first few days of life. This disposition is made manifest or increased, when either disturbance of circulation, or disease of vessels, or of the blood itself, is present. The notable alteration in the circulation which takes place at birth must therefore be regarded as a principal cause of the hemorrhage, and especially in cases of protracted labor, or of children born in a state of partial asphyxia, or of weakly children with atelectasis of the lungs. Various conditions have been found in the gastro-intestinal mucous membrane: hyperæmia, hemorrhagic erosions, ulcerations, and actual hemorrhage. In many cases, where the mucous membrane of the stomach has been found sprinkled with small ecchymoses, small rounded ulcers have been discovered; and these have by some authors been regarded as the real cause of melæna neonatorum, the ulcers themselves being brought about by thrombosis or embolism of the gastro-duodenal vessels, secondary to thrombosis in the umbilical vein. This is probably, however, the rarest cause for the hemorrhage; the most common cause being the hyperæmia and temporary congestion of the finer capillary vessels. Although ulceration may take place with extreme rapidity after birth, it would appear that it is usually of intra-uterine origin; and several cases are recorded; where such ulceration has led to actual perforation of the intestine or stomach. Another group of cases is formed by those of children infected with septic diseases or the subjects of hereditary syphilis. In the latter cases the hemorrhage may be the only evidence of the disease, the liver being found free from any syphilitic mischief. In the cases in this group, the prognosis has been clearly shown to be unfavorable. About half of the cases end fatally, and the immediate cause of death is usually the hemorrhage itself. A few cases, however, recover with marked rapidity.

PROF. WIDERHOFER records an interesting case of melæna neonatorum (*Allgem. Wien. Med. Zeit.*, No. 4, 1883), in which syphilitic manifestations were very distinct, and where hemorrhages had taken place from other than mucous surfaces, the case in many respects reminding one of hæmophilia or of purpura. Such cases he regards as due to the specific affection of the blood. The prognosis is bad, and treatment by hæmostatics is of no avail.—*London Med. Record*, June 15, 1883.

BICARBONATE OF SODA IN ECZEMA.—DR. ROUSSEAU has successfully used a pomade of bicarbonate of soda as an external application in eczema. It seems to alter the morbid anatomical elements of the skin, and restore it to the normal state. The strength of the pomade is: Bicarbonate of soda, grs. xv; lard or other base, ʒiss. When psoriasis exists at the same time, this pomade will cause it to disappear, but it is liable to return, and is then very difficult to cure.—*Revue de Thérapeutique*, July 1, 1883.

ON THE ENTRANCE OF AIR INTO VEINS DURING OPERATIONS.—In an article on the treatment of this grave accident (*British Med. Journal*, June 30, 1883), MR. FREDERICK TREVES points out that it can only occur in what may be termed dry wounds. The wounded vein must be either exposed to the air, or be covered by but a slight amount of blood before it can permit of air being drawn into its interior. In a deep wound filled with blood, the accident is impossible, and the strange exemption of tracheotomy wounds from this complication may be in some way due to the free venous bleeding with which they are often associated. It appeared to him that the best precaution to adopt in cases likely to be attended with the aspiration of air into the veins was to have an attendant ready with a sponge filled with water, which could be squeezed into the wound at the first alarm. With such a measure, no time need be wasted in searching for the vein; the entrance of air would be at once arrested, and, at the most, a little clean water drawn into the circulation. This plan he adopted in two cases. Bearing in mind that the wound is most dangerous when most "dry," it will be understood that the accident has often occurred while a tumor has been torn away from its attachments, and also after a deep wound has been well sponged out.

The second step in the treatment of the accident is to endeavor to remove the air that has already entered the chest. This, he thought, could be best effected by waiting until the next expiratory movement, and then bringing forcible pressure to bear upon the front of the thorax. The air so expressed bubbles up through the water or blood that still fills the wound, and is obviously unable to reënter so long as the wound is protected in the way indicated.

The ease with which a large quantity of air was expressed from the chest in one of the cases reported would render it difficult to endorse Mr. Erichsen's statement when he says: "We cannot, by any compression that we may employ, squeeze the air out of the heart." The elasticity of the chest in the young, the superficial position of the right auricle, and the lax walls of that cavity would appear to be facts opposed to Mr. Erichsen's conclusions.

The suggestion that the air should be sucked out of the auricle through a catheter passed down one of the main veins cannot be too strongly condemned. One of the strangest proposals current is that artificial respiration should be resorted to in these cases. The reasons for this proposal are not evident. There is not only quite enough air in the thorax already, but a great deal too much, and the dyspnœa depends not upon lack of air in the lungs, but upon lack of blood. The only probable effect of artificial respiration would be the introduction of more air into the veins.

Lastly, when all the air has been expressed, the wounded vein should be seized (most conveniently with a pair of Spencer Wells' forceps), and either entirely divided or ligatured. This procedure should be adopted during the expiratory movement. By the treatment advocated, the accident may be immediately dealt with, the entrance of air may be immediately arrested, and the parts placed in a convenient condition for the expression of the air drawn in.

EUCALYPTUS IN WHOOPING-COUGH.—DR. WHITTHAUER reports four cases of pertussis, treated with tincture of eucalyptus globulus, which recovered in a little over three weeks. The dose for children from two to four years of age was five to eight drops. One of the patients, eighteen months old, suffered from well-marked rickets. After taking the eucalyptus for four weeks, not only was the whooping-cough cured, but the enlarged epiphyses were reduced, and the child, who had never before attempted to stand on its feet, learned to walk (*Memorabilien*, Nov. 15, 1882).—*Edinburgh Med. Journ.*, July, 1883.

MASSAGE OF THE UTERUS.—The scientific manipulations comprised under the term uterine massage may be divided into four groups: 1. Those intended to benefit lesions of which the seat is easily accessible from the exterior; 2. Those which are applied to all the lower abdominal region, and which often constitute a preliminary operation; 3. Massage of the uterus through the abdominal wall; and, 4. Bimanual massage through the vagina and abdominal wall combined. The cases of the first group are generally in superficial subperitoneal exudations, or else situated in the abdominal walls above Poupart's ligaments. Often it is necessary to apply massage to the hypogastric region; the bladder is emptied, and the patient placed on her back on a resistant surface. The operater catches up and presses between the palm and the fingers the skin and superficial tissues. The whole abdominal wall, as far up as the umbilicus, is submitted to this treatment. Then the deeper tissues are subjected to it. These pinchings should be alternated by frictions with the fingers and palms of the hand, the whole operation lasting five or ten minutes. The skin should be previously oiled, and great delicacy be used in the manipulations. In many cases the pains appear to be situated in the abdominal wall, and the massage gradually abolishes this sensibility. After this, one may, if necessary, apply massage through the vagina and abdominal wall simultaneously. When an hypertrophied uterus, for example, can be grasped between the fingers, the hands may be applied flat on the abdomen, the fingers directed toward the pubis; then, by short and steady pressure, the masseuse seeks to grasp the uterus and knead it. More often it will be necessary to apply massage through the vagina. The index and middle finger of one hand are introduced into the vagina, and their extremities, carried into the posterior cul-de-sac, push the neck forward several times, so as to give mobility to the whole uterus. The other hand is placed on the abdomen, and grasps the uterus, the fingers in the vagina serving as a fixed point. When the organ is grasped, it is steadily compressed between the fingers of the two hands for several seconds. This is alternated by lifting up the uterus. Then, the two fingers being placed in the anterior cul-de-sac, the movements already described are repeated. The uterus should be grasped, as far as possible, between the fingers, and subjected to intermittent pressure or kneading. Jackson has recommended that the fingers be also introduced into the rectum. Displacements of the uterus, flexions, and versions have been frequently treated by massage, but without signal success. Better results are obtained in chronic metritis, and especially in cases of old pelvic peritonitis. Massage is positively contra-indicated in any acute accidents or a tendency toward acute manifestations. —*Journal de Méd. de Paris*, June 30, 1883.

IODINE PAINTING IN SMALLPOX.—In 1881, there was admitted to the Konotop Hospital, a woman suffering from lumbar pain and other prodromal symptoms of smallpox. To satisfy the wish of the patient, Dr. Vetroff painted the whole lumbar region with tincture of iodine. On the next day, the painted region was found covered all over with variolous rash, while the remaining surface of the body presented only two vesicles. The course of the disease was remarkably mild. Having learned this curious fact, Dr. Bojinski-Bojko (*Vratch*, No. 1, 1883), when an epidemic of smallpox broke out in his district, began to paint with iodine the anterior surfaces of the thighs in every patient who came under his notice in the prodromal stage of the disease. In all four cases treated in this way, the rash was strictly limited to the regions painted, and the course of the affection was extremely favorable. An attempt to substitute a sinapism for the iodine gave negative results.—*Practitioner*, July, 1883.

EXTIRPATION OF THE RECTUM, WITH THE FORMATION OF A MUSCULO-CUTANEOUS FLAP.—PROF. BUSCH refers (*Berliner klin. Wochensch.*, April 9) to an operation described by Hütter, in the year 1872, in which the rectum was extirpated, union between the mucous membrane and the external sphincter and integuments having been secured, so that the distressing occurrence of alvine incontinence was avoided. Only one or two instances of this operation have since been recorded, and in those cancer was the disease to be removed. It is, however, Prof. Busch remarks, in syphilitic stricture of the rectum that the operation is most eligible. This malady is one of the most painful and intractable to ordinary modes of treatment, such as dilatation by bougies or by forcible distention under chloroform, under which treatment the subsequent pain and suffering are most intense, and, when an incision is made, is not seldom attended with severe hemorrhage and fecal infiltration of the adjacent tissues, and consequent phlegmonous inflammation. Should the patient escape these dangers, he is still exposed to a recurrence of the same morbid conditions. For these reasons Prof. Busch operates in such cases, in a manner differing in several points from Hüter's description of his mode of proceeding, and relates a case in illustration.

A woman, aged 35, who had suffered from nodes on her elbows, which had, however, disappeared under the use of iodide of potassium, began to experience severe pain in defecation, the feces being evacuated in small quantities and with difficulty. Examination discovered several polypoid excrescences within the anus; the mucous membrane to the extent of three centimetres was thickened and raised into ridges forming a close, hard stricture, admitting only the end of a finger to the extent of about two and a half centimetres, beyond which healthy mucous membrane could be felt. After careful preparation of the patient, the operation was undertaken on Sept. 8, 1882. A transverse incision divided the raphé in the midst between the anus and the entrance to the vagina, and, curving on each side towards the sacrum, enclosed the anus in a semicircular incision. By division of the muscular fibres of the constrictor vaginæ and constrictor ani, the anterior surface of the rectum was reached. The septum between the anterior wall of the rectum and posterior wall of the vagina had now to be dealt with without opening into either of those cavities; the firm connective tissue could be divided only by the knife, a separation which it was difficult to effect. The posterior wall of the vagina was pressed upwards by an assistant, while Dr. Busch with his left hand pressed backwards the anterior wall of the rectum. Thus the connective tissue was put on the stretch, and the finger of the operator was made aware directly the knife came too near either wall. Moreover, the division was attended with profuse bleeding; every incision divided arteries, some of considerable size, so that altogether fifty catgut ligatures were used. The division, however, was finally effected, and above the stricture soft connective tissue could be felt around the rectum. The rectum was then divided with the scissors to the extent of half its lumen, and its edges provisionally secured to the skin by three strong silk ligatures to prevent it being drawn inwards. The division of the intestine was then completed, and the posterior surface of the stricture was reached from above. The stricture was readily detached from the loose connective tissue which filled the hollow of the sacrum, and the intestine was again divided at about the distance of two centimetres from the anus, the strictured portion, in length about five centimetres, being then shelled out. The lumen of the rectum was

more than half closed by the existing sutures of the mucous membrane; the remaining portion of the external part was followed up where it was most easily accessible from the opening of the wound (incision), whilst the contact of the mucous membrane was effected in the slowest possible manner. About twenty sutures were inserted; the perineal wound was again slightly opened; the effused blood readily escaped, and some iodoform was blown in. A drainage-tube was affixed, on both sides, to the nates, and the wound closed by silk ligatures which brought the flaps into their normal position. The anus remained somewhat open, through the division of the motor nerves. The finger inserted could feel the annular form of the sutured intestine, but not any trace of constriction.

The patient was much exhausted by the length of the operation, and suffered for some hours from vomiting. The first free fecal evacuation was passed on September 12th. Some portions of feces passed behind the sutures. A few days afterwards, a feculent purulent discharge appeared at the wound, and escaped also from the vagina, in which a small perforation was discovered. The healing of the wound was retarded by diarrhœa. On January 16th, of this year, the patient's condition was satisfactory. There was a slight mucous discharge from the vagina, but not of a blennorrhagic character. The wound in the vagina, and the perineal incision, had cicatrized. The sphincter ani had perfectly recovered its power. The finger passed into the rectum could detect a slight constriction, through which the whole index finger could be passed without causing pain. The evacuation of even solid feces is easily effected.

Prof. Busch adds the mention of another case of stricture of the rectum in which he had recourse to a similar operation, which, he adds, so far as he knows, has not been employed by any surgeon previously.—*London Medical Record*, June 15, 1883.

OBTURATOR HERNIA.—Very interesting statistics on this rare affection are to be found in a pamphlet on *Hernia* by Dr. B. Schmidt, published in 1882 as part of Pitha and Billroth's well-known series. The cases where obturator hernia has been diagnosed during life are reduced to twenty-five; of these, seventeen were subjected to operation, eight were relieved by taxis, but only five altogether were saved by the two methods of treatment. Dr. Hasselwander, of Hausham, in Bavaria, records in the *Aerztliches Intelligenzblatt* a successful case of operation for strangulated obturator hernia. The patient, a country woman, aged sixty-five, had suffered for three days from colicky pains, constipation, and flatulence. On two occasions she had been seized with vomiting. Her appetite was bad, and she felt pain in the left foot. When first examined, her face showed an anxious expression, her tongue was furred, her body emaciated, and her urine was highly albuminous. The abdomen was distended with flatus. No hernia could at first be detected. There were itching sensations in the left thigh, and numbness in the entire extremity. On closer examination, the depression, plainly marked on the right side, over the adductor longus in Scarpa's triangle, was almost effaced on the left, where the same region was painful on pressure. On deep palpation, an indistinctly circumscribed hard smooth swelling was found on the inner side of the femoral vessels, over the adductor longus. On vaginal examination, fulness could be detected within the left side of the pelvis. Partial reduction was effected; but the symptoms became very serious a few days later, so that an operation at length had to be performed. The adductor longus was laid bare by an incision extending from below the pubes for three inches along the line of its outer border. That muscle was then cleared of the cellular tissue lying in its anterior aspect, and drawn inwards. The fibres of the middle part of the pectineus were divided, and a well-circumscribed swelling was in this manner exposed. The existence of hernia being now certain, the entire incision was enlarged, upon which very troublesome venous hemorrhage occurred, and it proved difficult to control throughout the remainder of the operation. The external pudic arteries were drawn aside. The swelling was about the size of a pigeon's egg, and very tense; but it fluctuated slightly on pressure. Its surface was of a purple color. Some strong adhesions were separated by the finger. By the aid of blunt instruments used with great precaution, the sac of the hernia was opened; its outer layer was aponeurotic; its inner coat consisted of a thick œdematous tissue, easily lacerated. There was no fluid in the sac, and the intestine lay immediately against its inner wall. On widening the incision in the sac by laceration till it became of a sufficient width, the intestine was found to be deeply congested and very tense. The finger was then passed into the neck of the sac, very sharply constricted by the border of the obturator foramen and the ligamentous tissue in the neighborhood of that region. Incisions were made in the inner and lower borders of the neck of the sac, by means of a straight probe-pointed bistoury. The intestine was then carefully replaced. Only the end of the little finger could be passed into the foramen. The venous hemorrhage, the depth of the incision, and the lateness of the hour at which the operation was performed, apparently without the aid of any artificial illumination, made the operation very difficult. The wound was covered with an antiseptic plug. The patient passed a motion in the night, and was henceforth relieved from all intestinal troubles, though convalescence was prolonged through suppuration of the wound, the result of the damage done to the cellular tissue in Scarpa's triangle, and its extensive infiltration with venous blood. The patient, at the end of six weeks, was completely restored to health.—*British Med. Journal*, June 30, 1883.

FLOATING KIDNEYS.—DR. F. DURET has recently written a pamphlet on the diagnosis of floating kidney. The usual symptoms of floating kidney are pain in the flank, loin, or umbilical region, sometimes radiating and simulating renal or hepatic colic; or a sense of weight, sometimes even of pulsation, so that the condition is often the foundation of hysteria or hypochondriasis. Added to this, in many instances, there are digestive troubles, as flatulent dyspepsia and diarrhœa. The detection of the mobile tumor in the loin clears up many obscure cases; but Dr. Duret does not think the physical signs of resonance in the loin with a manifest depression of that region as mentioned by most writers are necessarily present. He divides the cases in which doubts have occurred as to diagnosis into three groups. In the one group, there is no appreciable tumor, but the symptoms are marked; and such cases have been mistaken for colic—renal, hepatic, and other—for neuralgia, lumbago, and even peritonitis, whilst hysteria has been a frequent diagnosis. In another group, where the signs are more evident, malignant tumors have been diagnosed. In a third, where the tumor is unmistakable, cases have been confounded with cancer of the liver, distended gall-bladder, even cancer of the stomach, splenic, uterine, and ovarian tumors—one case being actually subjected to ovariotomy. Dr. Duret's conclusions are that "renal ectopia" is comparatively rather common; its presumed rarity depending on the fact that it is so often overlooked. Therefore the possibility of its presence should be always borne in mind, and in cases of doubt no radical measures should be undertaken, on the ground that *primo non nocere*.—*Lancet*, June 30, 1883.

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SATURDAY, JULY 21, 1883.

INFANT FOODS.

IN the paper by PROF. LEEDS, which appears in this issue, we have presented some new and valuable data in regard to the chemical composition and physiological characteristics of certain infant foods. When we consider the high rate of mortality of infants, due directly or indirectly to improper alimentation, we can hardly fail to appreciate the importance of right views in regard to the composition and functions of the so-called "infant foods." This subject is, also, not without its commercial side. The preparation and sale of various kinds of aliment suited to the infant stomach has grown into a business of no small dimensions. The profits must be large if we may base an opinion on the lavish advertisement of these foods. The rivalry is keen, as any one may learn who will give even a casual inspection of the trade literature, or hear the statements of commercial travellers, or merely note the number of those employed to distribute samples of their unrivalled preparations. When the business is in active hands, and the competition close, prices fall to the lowest margin, and then, it has been said, ingenious methods of sophistication are employed to increase the profits. In a matter of such vital importance to the growth and development of the population the State should interpose, and the purity and quality of these infant foods should be made to conform to a proper standard. The work of Prof. Leeds is a timely contribution to our knowledge of the subject.

In the consideration of infant foods, the first to be taken up is human milk. This is, at the same time, the model and standard by which all other infant foods must be judged, and it is that which is most happily contrived to subserve the purposes of the growing organism. A very great variability in the composition of this fluid, in respect to its albuminoids and fat, and constancy in the quantity of its milk-sugar, are the characteristics on which Prof. Leeds places much stress. Surely he draws too sharp a distinction between the functions of the albuminoids and the carbo-hydrates. The view that the so-called heat-producing element — the sugar of milk—serves no other purpose, is now not held, since the conclusive experiments of Fick and Wislicenus, in their famous ascent of the Faulhorn. That by the oxidation of this substance force is evolved to be applied as muscular, nerve, or other force, and that it contributes to the growth and nutrition of certain tissues, are facts not now disputed.

Again, the albuminoids, although important as tissue-formers, are not so restricted in their office, but furnish force and heat to some extent. The classification of Liebig, whereby foods are arranged into tissue-forming and heat-producing, is much too restricted, and can be accepted only when thus limited.

Prof. Leeds undoubtedly expresses a fundamental truth when he says that "the problem of artificial infant feeding is to be found in the substitution of cow for human milk." The problem is solved of course when, by artificial means, the composition of the two fluids can be made to correspond. Hitherto, the devices employed to effect this have not been entirely successful. The milk of the cow, like human milk, varies greatly in the quantity of albuminoids and fats, whilst the sugar is a nearly constant quantity. Mere dilution with water serves to equalize the proportion of albuminoids; but the chief characteristic of the casein of the cow's milk —its solidity and impermeability to the gastric juice of the infant's stomach—is not readily overcome. The various artificial foods for infants serve—according to Prof. Leeds—the purpose of "attenuating" the casein clot, besides themselves contributing to nutrition. In various combinations of cow's milk food, attempts are made to be rid of this hard and indigestible casein. One of the most successful of these, in our experience, is a mixture of barley water and cream, sweetened with sugar of milk, and rendered a little alkaline by the addition of bicarbonate of sodium; and this we find is approved by Prof. Leeds from the theoretical standpoint.

The most interesting part of the lecture under consideration, and not less important than interesting, is the discussion of the various preparations intended for infant food. Our author divides them into two classes: farinaceous; Liebig's—so named

because made in accordance with Liebig's original directions, but variously modified. As the lecture in its entirety is before the reader, we need not stop to comment on these individual preparations. There are, however, certain general principles, in regard to which it may be desirable to have some discussion.

It can now hardly be disputed that starch kills the infants of our day in numbers. Prof. Leeds does not, therefore, state the fact too strongly when he affirms that the results of chemical as of physiological research are alike opposed to the use of preparations containing much starch. But the law formulated after so much observation and investigation is not without exceptions. It is undeniable that now and then infants are found to grow luxuriantly on food consisting for the most part of starch. The explanation of this apparent paradox is to be found in the undeveloped state of the salivary and pancreatic secretions in the first months of life. But it appears from the interesting observations of Dr. Keating, at a late meeting of the College of Physicians, that some infants are precocious, so to speak, in the development of the glands furnishing these secretions. Whether or not this is the final explanation why many infants die on a diet of starchy food, and a few thrive on the same, remains for further investigations to determine.

We recommend to our readers a careful study of Prof. Leeds' analytical examination of the various foods now so persistently urged on the attention of the medical profession. Are they all or less than they pretend to be? Are they adapted to serve the purpose of infant foods? If they consist of the ingredients alleged, and are produced according to methods published by their originators, it is clear that they differ so much amongst themselves in composition and mode of preparation that, although intended for the same purpose, they are not equally adapted to its accomplishment. An infant food must then be selected, not because it bears the name of this or that manufacturer, but with reference to the physiological and pathological condition of the infant requiring it.

DIPHTHERIA IN GERMANY—ITS CAUSE AND TREATMENT.

AN interesting discussion of this important subject has recently taken place at the Second Congress of German Physicians, sitting at Wiesbaden, April 13–16. It was participated in by Profs. Gerhardt, of Würzburg, Klebs, of Zürich, Heubner, of Leipsic, Jürgensen, of Tübingen, Rossbach, of Jena, Leube, of Erlangen, Edlefsen, of Kiel, Lictheim, of Bern, and others.

To the doctrine of the contagiousness and parasitic origin of diphtheria, there appeared to be no dissenting voice. There was rather a disposition to refine and elaborate the parasitic theory, so as to ascribe different forms of diphtheria to different varieties of fungus, such having been described by different observers in various instances, both micrococci and bacillus forms having been observed. To this view inclined the reporter, Prof. Gerhardt, and the co-reporter, Prof. Klebs. The latter referred to an epidemic he had encountered in Prague, of fulminating cases, with severe general symptoms, and especially hemorrhagic exudation into the central organs of the nervous system. In the false membrane of these cases were closely packed micrococci (spherobacteria). In another epidemic in Zürich the micro-organisms were bacilli composed of very short and narrow rods. In the latter epidemic the symptoms were very much less serious, the spleen was less enlarged, there was slight or no involvement of the kidneys, no defects of the liver and heart, and paralytic symptoms were less frequent. The children died, in fatal cases, from extension of the process into the bronchi, or inflammatory alterations in the lungs.

Edlefsen, on the other hand, claimed that in Kiel, where the bacillus form of diphtheria was more common, there was no essential difference in the course of the two forms, and that in the bacillus form, if death did not occur early in consequence of laryngeal obstruction, paralyses were frequent enough. The heart affections, in his experience, in diphtheria, did not consist always in parenchymatous degeneration, but rather in a paralysis of the nervous apparatus of the heart. This seems to us a happy suggestion of Edlefsen, accounting, as it does rationally, for those cases of sudden death in apparent convalescence from diphtheria, which have been rather loosely ascribed to heart-clot.

Gerhardt contrasted diphtheria with other infectious diseases in which, usually, the constitutional symptoms appear first, and the local manifestations later. In diphtheria, this order is reversed, although here also the fever is divisible into two periods—first that due to the local affection, which, in the lighter forms, may be the only febrile movement, to which in severe cases is added the peculiar diphtheritic fever. Gerhardt is inclined to consider as diphtheritic those slighter degrees of local involvement which we have been in the habit of regarding as follicular inflammations of such intensity as to produce circumscribed sloughs. Not only this, but Gerhardt believes we may have diphtheria without any membrane or local manifestation whatever. This, he says, is almost always of a chronic character. Klebs also speaks of chronic diphtheria, in which, after apparent recovery, intestinal symptoms appear, with enlargement of Peyer's patches, pre-

senting the reticular appearance of the first stage of typhoid fever. Klebs also refers to a case, rapidly fatal, where the local lesion was not larger than a penny. These last are facts in connection with diphtheria which we do not recollect to have seen noted, and we especially call the attention of our readers to them.

As to therapeutics, the views advanced were quite as various as those we are in the habit of meeting at home. Thus Gerhardt discards all methods which tend to produce irritation, and thus to favor the spreading of the fungus. He observes two indications—first, the loosening of the membrane, and second, the combating of the cause of the disease. The first is favored by inhalations of steam, lime-water, lactic acid, and the action of pilocarpin. He confirms also the statement of Rossbach as to the efficiency of papayotin as a solvent or loosening remedy. The second indication is fulfilled by measures which are essentially antiseptic—viz., the use of peroxide of hydrogen, eucalyptol, iodized phenol, chloral hydrate, benzoate of sodium, hydrochloric acid, sulphite of sodium, boracic acid, corrosive sublimate, hydrofluoric acid, oil of turpentine, etc.

Gerhardt also emphasizes greatly the necessity of what he terms etiological therapeutics and rational prophylaxis—hygienic measures of a personal and general character.

Heubner holds that the local treatment of diphtheria is of comparatively little importance, and that we must combat the poison by internal remedies; Jürgensen, that care should be taken to keep the throat cleansed, but that no caustic measures should be employed. To attempt to disinfect the body would be vain, and we do better to rely upon supporting measures, and to avoid all debilitating agents.

Rossbach considers the tonsils the usual portals of entrance for the diphtheritic fungus, and he therefore, as a measure of prophylaxis, extirpates these glands if enlarged, or applies the galvano-cautery if they are small; after this, he observes no more infection. He characterized papayotin not as an anti-diphtheritic, but as a solvent for the membrane, and calls attention to an inferior preparation which in course of time loses its active properties.

Leube always applies to the throat in the beginning of the attack, and as thoroughly as possible, a mixture of equal parts of alcohol and carbolic acid. In this Gerhardt concurred, since, he says, in the beginning diphtheria is a local disease.

EXTIRPATION OF THE THYROID GLAND.

UP to 1850, there were 70 excisions of the thyroid, with a mortality of 41 per cent.; up to 1877, 146, with a mortality of 21 per cent.; up to 1883, 240, with a mortality of 11 per cent., or, in general terms, four times as many operations and one-fourth of the earlier mortality. In this country, goitre so severe as to require extirpation of the thyroid, is rare, and the comparatively large experience of the late Dr. W. W. Greene, of Portland, was for us almost phenomenal. But, as we would naturally expect, the continental and especially the Swiss surgeons, have such exceptional advantages in the study and operative treatment of these generally formidable tumors that their statistics seem equally astonishing and successful.

At the Twelfth Congress of German Surgeons, no less than four papers were presented on this subject by Kocher, of Bern, who published, some time since, in the Swiss *Correspondenzblatt*, fifty-eight cases, and now adds forty-three more, by Bardeleben of Berlin, by Wölfler of Vienna, who reported sixty-eight excisions by Billroth, and by Maas, of Würzburg.

In the evolution of the operation, two of the chief dangers—hemorrhage and septicæmia—have been, to a large extent, overcome, the latter by antiseptic treatment, and the former by a methodical ligation of all the thyroid arteries and their branches, and also of all the larger veins whose position is generally pretty well defined. The recurrent nerve must, of course, be sought and avoided. So large a proportion as seven cases in Billroth's sixty-eight suffered with tetanus, of whom two died, four recovered, and one suffered a relapse after three years. Kocher lost one-fourth of the malignant cases in his last forty-three operations, but only 5.1 per cent. in the non-malignant cases. That tracheotomy is to be avoided, even in cases of severe dyspnœa, seemed to be the general opinion, as it interfered with thorough antisepsis and the restoration of the form of the compressed and not seldom softened trachea. Kocher, when the disease is unilateral, frequently extirpates only the diseased half of the gland with good results, whereas Wölfler advocates total extirpation.

GALVANO-CAUSTY IN OPHTHALMIC SURGERY.

BATTESTI, in his *Thèse de Paris* for 1882, gives an account of the results obtained from galvano-caustic treatment in certain ophthalmic diseases, as carried out at de Wecker's clinic. His experience demonstrates the superiority of galvano-causty over every other method of igneous cauterization. The special advantages are, it causes but little pain, and the application is not followed by any decided reaction; the effect is limited to the point of application; it rapidly diminishes the pain of ulceration of the cornea, and it stimulates the development of the new formative materials.

The special conditions in which this practice has been utilized are as follows:

In detachment of the retina galvanic puncture gives very encouraging results. The same practice, frequently repeated, seems to be a perfect substitute for enucleation of staphylomatous eyes. It may therefore be used in simple hernia of the iris, in ciliary blepharitis, in granulations of the conjunctiva, and may supplant all cutting instruments for the most part, in the removal of tumors of the conjunctiva and eyelids.

At de Wecker's clinic, also, they have used galvano-caustic treatment with great success in pannus of the cornea, in simple ulcers, in rodent ulcers, but strangely enough, it has not been successful in serpiginous ulceration with hypopyon, in which, indeed, the method of Saemisch with antiseptic dressings, is preferable.

THE LATEST DODGE.

IN the July number of *The Manhattan* appears an article entitled "The Question of Medical Ethics." In lengthy, but most vigorous sentences, the writer, a well-known and respected physician of New York City, undertakes to make the matter plain to the general public. It does not seem to occur to him that any intelligent reader will suspect him of making an *ex-parte* statement, but with admirable composure, and most cool assumption, he goes on to place the subject "in its true light" before the very public who, as he says, "from necessity, are not and cannot be conversant with the merits of the controversy."

To such confessedly incompetent judges are the advocates of the New Code willing to appeal. Truly their cause must be in a desperate plight, when such measures are resorted to. There was a time when physicians, as members of a dignified and honored fraternity, did not think it well to parade their differences in the columns of daily papers, or in the pages of new magazines; but under the inspiriting influence of the New Code all this is to be abolished, and the laundry work of the profession is hereafter to be done in public.

We sincerely trust there will be no attempt made to meet the New-Code men upon their selected stamping ground. No good can come from pointing out to the public the gross unfairness, the ludicrous one-sidedness of such ebullitions of wrath as that which appears in the July *Manhattan*.

Did we desire to go into the merits of this article at this time we should find it no hard task to prove the charge of unfairness which must lie against it. But such is not our purpose at present, we desire simply to direct attention to the fact that one of the legitimate results of the New Code is to be the practice of appealing to the laity to judge of professional differences.

The writer in *The Manhattan* says the Code of Ethics of the American Medical Association, and of every State society excepting that of New York, tends "to make the old physician a bully, the young one a hypocrite." It certainly does not encourage such fouling of its own nest, nor prohibit its adherents from being honest men, or gentlemen.

THE MEDICAL DEPARTMENT OF SHAW UNIVERSITY.

WE have recently received the catalogue of Shaw University, at Raleigh, N. C., and a copy of the *African Expositor*, an excellent paper published in its interests.

Eighteen years ago, Rev. H. M. Tupper, its President, founded the University for the colored race. In spite of apparently insurmountable obstacles—political, personal, pecuniary, and social—his persistent courage, tact, and force of character have made it an eminent success, so that the property alone is valued at over $100,000, and last year a medical department was added to its already wide curriculum. For this the State gave ample ground, and friends have supplied the necessary funds for the erection of two large brick buildings for the new department. One contains the usual lecture-rooms, laboratories, dissecting rooms, etc., and the other is a dormitory with accommodations for sixty students. The fees for a five months' course of lectures are sixty dollars, and a graded course of three years is recommended, but two will be accepted for the present.

The principle of self-help is applied as far as possible, and many of the students have supported themselves by manual labor. Indeed, they have made a large part of the furniture and all of the bricks in the five buildings, and have sold, for the benefit of the school, over 3,000,000 more. Room-rent, lights, fuel, and board cost only eight dollars per month.

We have noticed this institution at some length, because we believe it is doing wonderfully good work for the colored people of this country. They need physicians of their own race, and this medical school will not only provide them, but will also open a new avenue of self-support to the black man. The whole number of students in the University is 347, of whom 11 are medical students.

IT seems that in New York a certain valued citizen, named Okenberg, was at the point of death, and the doctor, evidently a man of a sanguinary mood, declared that to save his life transfusion was the only remedy. A negro named Banks thereupon offered him q. s., and, most fortunately, in spite, too, of this shocking mechanical miscegenation,

Okenberg got well. He alleges that he paid Banks privately, and also paid again for his services in the hotel bill. But Banks—his name is evidently and appropriately financial in its origin, and not riparian—was not thus to be put off. He is now suing the patient for $250 as an equivalent,—$192 for eight ounces of blood of 240 drops to the ounce, at ten cents a drop, the remainder being for his services.

It is a nice question this, the price per drop. If poor Banks' blood be worth ten cents, how much would Vanderbilt's or Jay Gould's be worth?

SOCIETY PROCEEDINGS.

THE PATHOLOGICAL SOCIETY OF PHILADELPHIA.

Stated Meeting, Thursday Evening, May 24, 1883.

THE PRESIDENT, JAMES TYSON, M.D., IN THE CHAIR.

CARCINOMA OF THE COLON AND STOMACH, WITH CARDIAC LESIONS.

DR. J. T. ESKRIDGE presented the specimens, with the following history:

Peter L., aged 60 years, Irishman, by occupation a dyer, was said to have enjoyed fair health until two years ago, when he suffered from a severe attack of inflammatory rheumatism. He knew but little of his family history, and could not give the cause of his parents' death. He never complained of heart disease. During the latter part of the year 1881, about eighteen months before his death, he first began to complain of pain in the epigastric region, attended by eructations of a sour, slimy liquid. Soon he experienced a sense of nausea coming on an hour or more after eating. About three months after the first appearance of symptoms of gastric disease, he began to vomit. At first vomiting occurred occasionally, but soon it took place several times a week, and finally once or twice each day. He lost flesh rapidly.

In the early part of March, 1883, he was admitted into the wards of the St. Mary's Hospital, when he came under my observation for the first time. He was very weak and greatly emaciated. His pulse—of the Corrigan type—was 80 per minute. When resting in the recumbent posture his breathing was quiet. Temperature was usually one degree below normal. The radial and temporal arteries were rather hard, and the latter were tortuous. A diastolic murmur and a systolic murmur were heard at the aortic orifice. The impulse of the heart was not very strong, and the left ventricle did not appear to be greatly enlarged. The lungs were emphysematous, and an area of impaired resonance, amounting to almost dulness, was discovered on each side of the spinal column, opposite the spines of the scapula. An indurated mass, apparently about the size of a walnut, more or less movable, was felt in the epigastric region to the right of the median line, and about midway between the ribs and the umbilicus. The growth was not sensitive to rather rough manipulation, and he had not experienced any pain for a number of months. His bowels were sluggish, and it required active agents to evacuate them. No tumor beside the one connected with the stomach was felt or suspected in any other portion of the abdomen. He vomited almost daily. The liver and spleen were not enlarged. The urine was free from albumen.

By securing daily evacuations from the bowels, and giving him nutritious, easily assimilated food, the vomiting nearly ceased. He improved, and left the hospital the latter part of March. Early in April, he was admitted to the Jefferson Medical College Hospital, where he came under my care the first of May. At that time he was eating but little, the abdomen was considerably distended by gas, and his bowels required repeated large enemata, or enormous doses of purgatives to secure their action. On the fourth of the present month, he experienced great pain in the right iliac region and just to the right of the median line of the abdomen, midway between the pubes and umbilicus. Over and around the latter painful spot—a circumscribed, highly tympanitic and sensitive area, about the size of a man's fist, was observed. Circumscribed peritonitis was diagnosed. Large doses of morphia, administered hypodermically, were required to relieve pain. The stomach became irritable, and the peritonitis more general. He died during the afternoon of the eighth of May.

Sectio cadaveris four hours after death, by the pathologist of the hospital, Dr. Morris Longstreth.

Thorax.—About seven ounces of perfectly clear serum was found in the pericardium. No evidence of pericarditis existed. Left side of heart firmly contracted; right side relaxed and contained considerable fluid blood. Right side of heart and its valves normal; no lesion found at mitral orifice. Free borders of the leaflets of the aortic valve are thickened and slightly contracted, allowing regurgitation to take place at the aortic orifice. Aorta atheromatous, dilated, and decidedly roughened near the aortic orifice. Left ventricle slightly hypertrophied.

Lungs deeply pigmented, and generally emphysematous; both congested posteriorily; surfaces of both apices covered with patches of fibroid thickening. Abundant evidence of diffuse peri-bronchitis chronica was present. Bronchial tubes of the lower lobes of both lungs much dilated. Bronchial glands at the root of the lungs very much enlarged.

Abdomen.—On opening the abdominal cavity, considerable very offensive gas escaped from the upper part. On the right of the median line of the abdomen, from the umbilicus downward, the abdominal wall anteriorly was adherent to omentum and intestine over an area of about five inches in diameter. Lower third of abdominal cavity was filled with a yellowish-white cloudy liquid. Intestines bound together by numerous adhesions. The stomach, which I show you, is small, and its coats are thickened. The hypertrophy of the wall of the stomach is slight at the cardiac end, but gradually increasing, becomes considerable at pyloric. The wall of the pylorus and adjacent portions of the stomach and small bowel is about one-half inch thick. At this point the mucous surface presents several fungous-looking outgrowths. The small bowel, with the exception of about half an inch of the upper portion of the duodenum, appears normal. In the colon, about six inches from the ileo-cæcal valve, is a stenosis, barely admitting the end of my little finger. The wall of the colon at the point of narrowing, which extends three or four inches of the length of the bowel, is greatly hypertrophied, measuring about one-third of an inch in thickness. The colon, from its beginning to point of constriction, is dilated into a large pouch measuring four and one-half inches in diameter. The dilated portion of the bowel presented a dark gangrenous appearance, distended by gas, was adherent to the anterior wall of the abdomen, just to the right of the median line. The remaining portion of the large bowel appeared to be healthy. No en-

largement of the mesenteric glands was observed. Liver, spleen, and pancreas were small and firm, but free from malignant growths. Both kidneys were reduced in size, contained a few small cysts, their cortical substance was lessened, and their capsules were abnormally adherent in places.

Remarks.—It is worthy of remark that although considerable thickening and induration existed at the pyloric end of the stomach, the orifice remained sufficiently patulous to allow the food to come in contact with the intestinal juices. Another point of interest is seen in the existence of so great amount of narrowing in the calibre of the large bowel with no symptoms, except easily obviated constipation, until a short time before the man's death. It seems to me remarkable that a bowel so dilated above the point of a narrow constriction should be able to respond painlessly to purgatives.

MITRAL STENOSIS AND REGURGITATION FOLLOWED BY TRICUSPID REGURGITATION AND GENERAL DROPSY.

Dr. J. T. Eskridge presented the specimens, with the following history.

Ellen D., 48 years old, single, servant, was born in Ireland. Her mother died from some chest trouble when about forty years of age. Her mother's relatives were subject to "pleurisies and rheumatism." Her father lived to an advanced age. Ellen enjoyed good health until six years ago, when she suffered from three attacks of rheumatism within a few months. During each attack she was lame in the feet and legs. After those rheumatic seizures, she was comparatively comfortable until the early part of the year 1879, when she noticed that going up and down stairs, or prolonged or active exercise, exhausted her more than usually, and gave rise to palpitation of the heart. In the year 1880, she had another slight attack of rheumatism. She said her feet were almost constantly swollen during the years 1881 and 1882. Last summer her general health improved, but when the cold weather of the following fall and winter set in, increasing dropsy and dyspnœa returned. She was admitted into the wards of the St. Mary's Hospital, December 5, 1882, suffering greatly from general cardiac dropsy and associate symptoms. One month later it was noted, that she temporarily improved after her admission, but the dropsy recurred and she failed rapidly.

January 10, 1883, her condition was observed to be as follows: She was jaundiced, irritable, and morose. She dozed frequently, her mind seemed clouded, but she was very restless. The tongue was heavily coated, breath had an offensive urinous odor, stomach was irritable, and anorexia almost complete. The urine was diminished in quantity, and contained abundance of albumen. Effusion existed in each pleural cavity, slight in the right, but the left side was filled up to the lower angle of the scapula. The pericardium contained an increased quantity of liquid. The lungs were congested, and numerous moist bronchial râles were present. Arterial pulsation was seen only in the carotids. Visible venous pulsations were very pronounced in the veins of the neck, and in one or two superficial veins on the anterior surface of the chest. After emptying the veins and exerting pressure upon them, they were observed to fill from the cardiac side and again pulsate while the finger was still firmly held against the vessels. A wavy impulse extending over a large area was seen. The cardiac pulsation was most marked just below the lower end of the sternum.

The pulse was very irregular and difficult to count, being about 120 per minute; it was intermittent, and irregular in volume and frequency. The variations of the pulse were most prominent when the hands were raised above the head. The impulse of the heart was felt over a large portion of the anterior surface of the chest. The area of the cardiac pulsation was bounded on the left by a point in the fourth intercostal space external to the left nipple; on the right by a point one inch internal to the right nipple; below by a point two inches below the sternal notch, and above by the left second intercostal space. Hepatic venous pulsation was very distinct. Percussion dulness was increased most on the right side. The pulmonary and aortic valves were apparently free from disease. A presystolic murmur, whose seat of intensity was over the left fifth costal cartilage, was heard over the anterior surface of the chest from nipple to nipple, and in the left axilla. It was difficult to determine whether the murmur was audible posteriorly, as the bronchial and crepitant râles and rapid breathing were confusing. Four or five days later, the presystolic murmur ceased to be audible. At that time general anasarca was well pronounced. January 24, she went into a semi-conscious condition, which gradually deepened into coma. She died January 26. She expectorated considerable blood and frothy mucous during the last month of her illness.

Sectio cadaveris twenty-four hours after death. Body well frozen. Considerable adipose tissue still remained. Thoracic and abdominal cavities only examined.

Thorax.—Left pleural cavity almost completely filled with a thin, straw-colored, serous fluid. Right pleural sac nearly half full of a similar effusion. There were no pleural adhesions. The left lung was crowded into a small space and congested; the lower lobe sank in water. The right lung was being encroached upon by the effusion, and its lower lobe was consolidated; the upper emphysematous.

The pericardium contained about six ounces of fluid similar to that found in the pleural cavities. No adhesions or patches of fibrinous exudation were seen on the surface of the heart. The cavities of the heart were relaxed and filled with dark fluid blood. The right auricle is greatly dilated. The tricuspid orifice admits the ends of the thumb and all the fingers of one hand up to the distal joint. The right ventricle is dilated and its wall is thickened. The tricuspid valve is insufficient. The valves at the pulmonary and aortic orifices are thin but competent; these orifices are not constricted. The wall of the left ventricle seemed to be thickened, and the ventricle is slightly dilated. The left auricle is greatly dilated. The curtains of the mitral valve are adherent to each other near their attached borders, and constrict the orifice, which they are no longer able to close, into a round opening only large enough to admit the end of the index finger.

Abdominal Cavity.—The bloodvessels of the stomach and bowels distended. The mucous membrane softened. Liver, heavy, dark, and grated under the knife. Spleen, enlarged, congested, and denser than normal. Pancreas, healthy. Both kidneys were congested, slightly cirrhotic, but contained considerable functionating tissue. General dropsy is rare in cases of mitral stenosis, except, as in the present instance, where it is combined with mitral insufficiency. No thrill was present during my attendance, which extended over a period of four weeks immediately preceding her death. The mitral presystolic murmur ceased to be audible during the last two weeks of her life. The absence of the presystolic murmur in cases of extreme stenosis of the mitral orifice, late in the disease, when the heart is weak and is acting rapidly and irregularly, has led some observers to believe that the murmur is frequently absent throughout the course of this form of valvular lesion. To this point I directed special attention in a recent paper on the "Diagnosis, Prognosis, and

Treatment of Mitral Stenosis," read at the last meeting of the Pennsylvania State Medical Society.

CONGENITAL MALFORMATION OF THE HEART WITH CYANOSIS; DEATH AT THE AGE OF TWENTY-NINE YEARS, FROM PULMONARY TUBERCULOSIS.

DR. J. T. ESKRIDGE gave a detailed account of the above case. The patient, a man, twenty-nine years old, had never been strong and able to run and play like other boys without suffering from severe palpitation of the heart. So far as the man could remember, he did not become blue before his twelfth year. After the occurrence of cyanosis his breath became much worse. He had rarely experienced pain in the region of the heart. One year ago, he first observed pains shooting through the upper portion of the right side of the chest. These continued and at times were severe, being sharp and lancinating in character. From the first appearance of the pains he began to lose flesh and strength. About the time of the beginning of the chest pains, a dry, hacking cough commenced, but expectoration was not profuse until a few weeks before he first saw him, when he took a heavy cold, which was followed by high fever, great prostration, and profuse night-sweats. He was admitted to the St. Mary's Hospital, January 2, 1883. The surface of his body presented a dusky hue, and his face, neck, hands, and feet (especially the fingers and toes) were quite blue. When he sat up, the blue color of the mucous surface of lips deepened into dark purple. The distal phalanges of the fingers and toes were hypertrophied, and the small superficial veins of the face, fingers, and various other portions of the body were easily seen and counted. The upper lobe of the right lung was consolidated and contained a cavity; the lower lobes were partially infiltrated. In the left lung the lower lobe was solid, and the upper was being infiltrated. Over the left lung, pleuritic friction râles were numerous. No venous pulsation was discovered. A presystolic thrill was felt in the third and fourth intercostal spaces to the left of the sternum, and was barely appreciable in the third intercostal space at the right border of the sternum. Percussion dulness was increased laterally. The cardiac impulse was felt and seen in the fourth intercostal space external to the left nipple.

A systolic and a presystolic murmur with their seats of intensity near the left fourth costo-sternal articulation were heard. The systolic murmur was audible anteriorly over a large area, and posteriorly at the lower angle of the left scapula. Anteriorly the systolic murmur was heard as low as the seventh rib on each side the sternum, faintly just below the left clavicle, but it was lost just below the right clavicle. The systolic murmur was audible in the left axillary region, but not in the right. The presystolic murmur was limited to a small area. The next three days the temperature varied from 100° to 102.5°. On the 6th, he coughed up several mouthfuls of blood unmixed with mucus. From the 7th to 11th, there was profuse expectoration of purulent matter containing small quantities of blood. Breath was very offensive, and the apex of the right lung was breaking down rapidly. Diarrhœa was rebellious and exhausting. He died suddenly on the morning of the 12th.

Post-mortem examination was made about four hours after death. The lungs were infiltrated by tubercle. The left pleural cavity had been obliterated by general pleuritic adhesion, the right contained about three pints of sero-sanguinolent fluid.

Heart.—Numerous pleuro-pericardial adhesions were present. The pericardium was not inflamed on its internal surface, and was nowhere adherent to the heart, but it contained about two ounces of a straw-colored, serous fluid. The heart was anæmic, flabby, and dilated. Its cavities contained a small quantity of fluid blood. No heart clot had formed. The right auricle, including its appendix, was enormously dilated. The right auricular wall was somewhat thickened. Across this auricle a thin, membranous strip stretches from right to left and from above downward. Its attachment above was at the upper portion of the auricle to the right of the appendix, below at the left margin of the tricuspid orifice. The imperfect septum, he thought, had been an attempt by nature to divide the auricle into two nearly equal compartments. The inter-auricular septum was imperfect, the foramen ovale being sufficiently patulous to admit the passage of his thumb from the right auricle into the left. The right auriculo-ventricular orifice was enlarged and admitted the ends of the thumb and all the fingers of one hand. The right ventricle was dilated to nearly twice its normal size. Its wall was not much thickened. A patch of fibroid induration, one inch long by half an inch wide, was seen on its endocardial surface. The anterior and posterior segments of the tricuspid valve were united and formed one large leaflet. The left segment was so situated that it could not have aided materially in closing the auriculo-ventricular orifice. The greater portion of the imperfect segment was stretched across the ventricle near the apex of the heart, and more or less obstructed the current of blood from the ventricle into the pulmonary artery. Free regurgitation at the tricuspid orifice was permitted on account of the large size of the orifice and the imperfect condition of the valve. The other valves of the heart were thin but competent. None of the orifices of the heart were constricted. The left cavities of the heart were rather small. The pulmonary artery was smaller than normal.

No special disease besides a fatty condition of the liver was seen in the abdominal organs.

In his remarks on the case, Dr. Eskridge said that the membranous strip which extended across the right auricle vibrated with the auricular current of blood, and probably had given rise to a presystolic murmur. If the blood in struggling through the patulous foramen ovale had given rise to a murmur, it also would have been presystolic in time. He stated that the presystolic murmur in the case was well defined and easily distinguished from the systolic one, and thought it was unfortunate for the science of physical diagnosis that both these conditions existed in the same heart. He knew no means by which one would be able to attribute the presystolic murmur to one or both of them, since it was not positive whether an inter-auricular current was capable of developing a presystolic murmur. He desired that the heart should be referred to a committee of three for a fuller report on the congenital malformation.

DR. NANCREDE referred to the development of the heart as explaining such variations, etc. It was referred to a special committee for examination.

DR. J. T. ESKRIDGE presented the specimens from a

CASE OF EXTREME MITRAL STENOSIS, DEATH RESULTING IN A FEW MONTHS FROM SEQUENTIAL LESIONS WITHOUT GENERAL DROPSY,

with the following history. Charlie, æt. fifteen years, died in St. Mary's Hospital during the latter part of December, 1882. In February of that year, during my term of service, he first came to the hospital, suffering from acute bronchitis. The attack ran its course in a week or two, but the heart, during and after the seizure was exceedingly irritable, frequently beating from 120 to 150 times per minute. Infrequently he complained of pain over the præcordial region. The heart was

repeatedly and carefully examined, but no endocardial murmur or pericardial friction-sound was heard. No thrill or friction fremitus was felt. He was kept in the recumbent posture, and counter-irritants were applied to the præcordium. At the end of about two weeks, he left the hospital feeling tolerably well, although the cardiac pulsations were rarely below 100 per minute, and a little exercise or excitement of any kind, would increase them to 120 or more.

In August, 1882, he reëntered the hospital, and was again suffering from acute bronchitis, with free secretion attended by numerous subcrepitant and large moist bronchial râles. After the subsidence of that attack, which took place in about a week, a decidedly rough and rather long presystolic murmur was heard. During the remainder of his life he stayed in the hospital, and was engaged most of the time in waiting upon the sick in the ward. Ascending and descending stairs, and active exercise of any kind, greatly exhausted him, causing the heart to beat tumultuously, and he to pant for breath. He rapidly grew worse, and by the latter part of November, he was spitting quantities of blood rather frequently. The lungs soon became so engorged that the frequent hæmoptysis did not relieve them. During most of December, he remained in bed propped up by pillows. The last two weeks of his life, he was air-hungry, and gasped for breath. His extremities were cool and cyanosed, his face was of a dusky hue, and he expectorated large quantities of blood and frothy mucus. No general dropsy existed. Considerable albumen was found in the urine. Physical signs of pulmonary congestion and œdema, bronchitis, pleurisy with effusion, pleuro-pericarditis, and pericarditis with effusion in the pericardium, were present during the last few weeks of his life.

Sectio Cadaveris.—Numerous recent and old pleuritic a hesions were found, especially in the neighborhood o the heart. Pleuræ were slightly adherent to the upper portion of the pericardium by means of recent exudation. Considerable fluid, containing only a trace of lymph, and no pus, was seen in the pleural sacs. The pericardium contained several ounces of nearly clear serum. Several patches of recently exuded lymph were present on the outer surfaces of the ventricles. The weight and size of the heart were greatly increased. The right cavities of the heart were relaxed and filled with dark fluid blood and a chicken-fat clot. The left side of the heart was less relaxed, and contained a smaller quantity of blood. The wall of the right ventricle is nearly twice its usual thickness; its cavity is slightly enlarged. The right auricle is dilated. The valvular curtains at the pulmonary orifice appear competent, and show no inflammatory deposits. Tricuspid valve slightly incompetent, otherwise normal. The left auricle, with its appendix, is enormously dilated. The left ventricle is concentrically hypertrophied. The aortic valve curtains are somewhat thickened, but they are competent, and do not encroach upon the orifice. The mitral curtains are adherent to each other along their entire right borders, and along the external portion of their left free margins, thus leaving a space only four millimetres long by two wide for the blood to pass through. The valve has a leathery feel, but neither it nor the surface of the auricle is rough. The mitral valve does not present the funnel-shaped appearance usually seen in such cases, because, probably, the curtains had adhered to each other irregularly, and left the small opening to one side of the centre of the normal orifice. The lungs were dark, deeply congested, and more or less œdematous. Several ounces of clear serum were found in the peritoneal cavity. Liver, spleen, and kidneys dark and congested.

One point in the clinical history of this case is worthy of special attention. The first symptoms, directing attention to cardiac disease, were the rapid pulse and exceedingly irritable condition of the heart. These symptoms existed for several weeks, and probably for a few months, before a murmur was audible. An explanation of these, without the presence of a murmur, will be found by a careful study of the diseased mitral valve before us. Neither the valve nor the surface of the auricle is roughened, consequently, for the production of a presystolic murmur under such conditions, it is necessary for the blood-current to meet with sufficient resistance in its passage from the auricle into the ventricle to enable it to set up decided vibration in the valve itself. Before sufficient mechanical obstruction took place at this orifice, the parts being comparatively smooth, to develop a murmur, inflammation and beginning adhesions of the curtains to each other were taking place. The latter conditions, although not sufficient to give rise to a murmur, rendered the heart irritable. If the explanation given is the correct one, it points to the significance of some irritable hearts, where no murmur is present to announce cardiac valvular disease. The length of the murmur was greater than that of any mitral presystolic murmur that I had heard before. It seemed to be divided into two parts, both occurring between the diastole and systole of the heart. The first part was the softer, and had less intensity; the latter was very rough, and ended abruptly. They corresponded to what Hayden has described as the post-diastolic and presystolic murmur. He says they always denote great obstruction at the auriculo-ventricular orifice. The post-diastolic murmur, he thinks, is due to the passive flow of blood from the auricle into the ventricle, the presystolic taking place when the auricle contracts. If subsequent autopsies should almost constantly associate the prolonged or double presystolic murmur with great stenosis at the mitral orifice, it will be of value in prognosis, as life cannot long continue when stenosis is as great as seen in the heart I exhibit to-night.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Stated Meeting, June 6, 1883.

THE PRESIDENT, ALFRED STILLÉ, M.D., IN THE CHAIR.

DR. J. M. KEATING made

SOME OBSERVATIONS ON THE SALIVARY DIGESTION OF STARCH BY INFANTS.

Recently, in a late English work, he said, I find the following: "During the first few months, farinaceous food of every kind should be avoided, for the child's stomach (?) cannot digest it. Until the third month, or even later, no saliva is secreted, and without this floury foods cannot be assimilated." (*Management of Infants, etc.*, by Howard Barrett.) This idea is so prevalent, and most of us have adopted the statement as representing the teaching of physiologists, that it has always been a matter of surprise to those interested in the feeding of infants to find occasionally, especially among the poorer classes, infants fed upon corn-starch or other farina, almost to the exclusion of other food, and thrive.

At present, we presume that amylaceous material has of necessity to be converted by hydration into glucose, and for this reason I will not detain you by indulging in the more speculative aspect of this subject, as to whether dextrine is capable of being absorbed, and which of the two ferments, that of the salivary glands or of the pancreas, is of the most importance.

We have left this matter for further investigation. Prof. Albert R. Leeds, in his very able *exposé* of the subject of foods as regards their chemical constituents, made the matter so clear, that in his table of the analyses we have evidently an accurate guide for the selection of food in individual cases. But as the general belief is that for infants of a tender age our choice should fall on that which contains a minimum quantity of starch and a maximum amount of vegetable albuminoids, or foods, based on the Liebig formula, I deemed it valuable to institute a series of experiments, the result of which I confess were rather surprising, to test the saliva of infants, and to satisfy myself that the reason why some infants apparently thrive on starchy food is not due to any change in the starch in its preparation, but depended upon contact with secretions well established in childhood.

In these tests we endeavored, as far as possible, to exclude all error. Corn-starch was used, it having been previously boiled, cooled into a paste, and portions of this were put into little linen bags, and given to infants to suck for two minutes at a time; Pavy's test was then used; the corn-starch paste exhibited before the experiment no evidence of sugar change.

The linen was thoroughly boiled without discoloration of the solution. The bags with their contents were in each case thrown into a test-tube, and I submit for your examination the accompanying report.

To the resident physicians of the Philadelphia Hospital, Drs. B. F. Hawley and A. E. Roussel, I am indebted for assistance in this matter, as many of these tests were repeated a number of times by them, and great care was used to insure accuracy. My report includes the results obtained by experiments with the saliva of twenty-one children—varying in age from six days to seventeen months. The sugar-change was noted in all but three—one of these was a babe six days old, whilst in another babe seven days old a marked reaction was observed. I feel satisfied that some infants do digest starch provided it is presented to them in a digestible form, and also that the salivary secretion which occurs earlier than we have been accustomed to believe, is allowed to come in contact with it, and I cannot but attribute the many statements to the effect that starchy food in small quantities is contra-indicated, to the fact that the secretions of the mouth are less liable to exert their influence when such food is administered by bottle and deposited in a surprisingly short time in the acid juices of the stomach. If starchy food, such as barley flour, oatmeal, rice, wheat flour, etc., is indicated on account of its highly nutritious qualities which exist in all portions of the grain and deemed advisable in the feeding of children, our few observations teach us that they should be administered in such a way as to insure their thorough digestion, and I am satisfied that the surprising results we witness, especially among the poor, of thriving table-fed babes, is due to the mode of feeding more than to the fact that they are exceptional and astonishing cases. My table shows that the age of the infant is not a guide to the quality of its saliva, and we should bear this in mind when choosing the form of food. Thus, should we be called upon to regulate an infant's feeding, it would be important for us to test the saliva.

If we find a sugar change taking place, we might incorporate with milk small quantities of one of the cereals, either barley, oatmeal, or wheat. On the contrary, should the test prove negative, Horlick's or Mellin's food would be decidedly preferable. But, while thoroughly convinced that the saliva is a most important element in digestion, we cannot overlook the fact that starchy foods have also to run the gauntlet of the pancreas, which organ, if it possess in childhood relatively the same power that it does in latter years, is far more active than the salivary glands. We cannot, then, overlook the value of a microscopic examination of the stools of all bottle-fed children, for I believe that by this alone we can regulate the quantity of farinaceous food, detecting the proportion of the undigested residue.

The following are my conclusions:

The saliva of some infants possesses the property of converting starch into glucose, regardless of age.

The age of the infants cannot be taken as an indication of this property of its saliva.

When such a condition is found to exist, a small quantity of well-prepared farinaceous food is valuable as an element in the diet, incorporated with mixed cow's milk.

An examination of the stools of children so fed would be a guide as to the quantity of starchy food to be used, and when farinaceous food is employed, slow feeding is probably preferable to the bottle.

DR. N. A. RANDOLPH, Assistant Demonstrator of Physiology in the University of Pennsylvania, then read the following

NOTE ON THE FECES OF STARCH-FED INFANTS.

The series of experiments presented in the preceding paper by Dr. Keating seems to me to be in the highest degree suggestive, for it is only rational to suppose that the development of the amylolytic ferment of the pancreatic juice is coincident with the appearance of the analogous salivary ferment. Inasmuch, however, as the food even in spoon-fed infants is retained but a short time in the mouth, and further, as the continued action of the saliva after it enters the stomach is as yet problematical, the only absolute control for such observations is afforded by an examination of the feces.

Through the kindness of Dr. Keating I have been enabled to examine the stools of twenty-four starch-fed infants, of ages varying from forty-five days to eighteen months. Twenty-three of these children were fed upon cracker-dust, water, and condensed milk. The twenty-fourth received corn-starch boiled in milk.

The freshly evacuated feces of each infant were carefully bottled and labelled, and a drop of a solution of iodine was added to a small portion of each specimen, which was then submitted to microscopical examination. Besides turning the starch blue, and indicating the presence of dextrine by a peculiar mahogany-red color, the iodine has the advantage of rendering any fats which may be present much more readily apparent. The reaction of each specimen was taken, but though this varied from acid to alkaline and neutral, no correlation between the reactions and the other properties of the specimens could be observed. A decoction of each was tested for glucose with freshly prepared Fehling's solution, but except in one instance no appreciable amount could be found.

The presence of *starch* was exceptional and apparently in no degree dependent upon the age of the child. The stools of eighteen out of the twenty-four children contained either no starch, or but a trace, *i. e.*, no more than is frequent in the evacuations of a healthy adult upon a mixed diet. Six of these specimens were from children of three months or less—the youngest being but forty-five days old. In many cases the broken and empty cellulose envelopes of the starch granules were clearly discernible.

The six infants in whose evacuations a noteworthy amount of starch was present, were aged respectively three, four, ten, thirteen, fourteen, and seventeen months. The eldest two were in very bad health.

The following is a tabular statement of the age, diet, and appearances of the feces in the children forming the subjects of this study.

An Examination of the Feces of Twenty-four Starch-fed Infants.

No.	Age.	Food.	Starch present.	Remarks.
1	45 days.	Condensed milk and cracker dust.	None.	
2	2 mos.	"	Traces.	
3	2+ "	"	"	
4	3 "	"	"	Twice examined; no fat before inunction, about 10 per cent. after.
5	3 "	"	"	
6	3 "	"	About ¼ starch.	
7	3 "	"	Traces.	
8	4 "	Corn-starch and milk.	"	
9	4 "	Condensed milk and cracker dust.	None.	Many broken cellulose envelopes.
10	4+ "	"	Traces.	Evidences of potato surreptitiously given.
11	5 "	"	About ⅛ starch.	
12	5+ "	"	None.	
13	5+ "	"	"	Many bacteria.
14	6+ "	"	"	10 per cent. fat; had had inunctions.
15	8+ "	Breast and cracker food.	Traces.	
16	10+ "	Condensed milk and cracker dust.	More than normal.	Many bacteria; evidence of potato surreptitiously given.
17	13— "	"	20 to 30 per ct.	Some glucose present, and indications of dextrine; saliva was found to be inefficient.
18	14— "	"	Traces.	
19	14 "	"	"	
20	14 "	"	10 p. ct. starch	Sick.
21	14+ "	"	None.	Except a few large cells containing starch from potato.
22	17— "	"	"	
23	17— "	"	Over ¾ starch.	Syphilitic; saliva was found to be inefficient.
24	18 "	"	Traces.	Indications of dextrine.

The facts presented appear to justify the following conclusions:

First, that *many* infants of under three months can digest starchy foods.

Second, that the individual variations in this regard are so numerous that no broad and general statement can be made as to the period at which infants *begin* to digest starches; and

Third, that the physician can be absolutely certain that a farinaceous ingredient in the diet of a young infant is beneficial only by an examination of the dejecta under such diet.

After the reading of the preceding paper,

DR. KEATING spoke of one case in which fat was found in the feces—cod-liver oil had been administered in the form of inunctions, and the child fed alone on Borden's condensed milk.

DR. RANDOLPH replied that he had found 10 per cent. of fat in the feces of a child which was receiving two inunctions of cod-liver oil daily. He was now conducting some experiments upon this subject, and intended to report the results to the College in a communication to be read at a future day.

CORRESPONDENCE.

THE PROPHYLACTIC TREATMENT OF DIPHTHERIA.

To the Editor of THE MEDICAL NEWS.

SIR: In THE MEDICAL NEWS of June 30th, Dr. F. P. Porcher recommends a prophylactic treatment for diphtheria, which I fully endorse.

On the 21st of July, 1879, I was called to a case of diphtheria, which was the first of over one hundred cases of the disease which occurred during an epidemic in this vicinity.

The type proved to be very malignant, seven cases were fatal, and died within eighteen hours of the first noticeable symptoms; one as early as six hours; five were left completely paralyzed; four of the five recovered; one died from strangulation while eating.

The treatment used, was tr. mur. iron, chlo. potash, and quinine, given very freely with a liberal allowance of milk punch and eggnogg.

The disease proving very malignant, I put the children in the infected district on the above medicines as a prophylactic. In the houses where the disease proved malignant, I gave it every three hours. Among those who were taking the medicine, but one case of the disease developed, and that case was taken sick within twenty-four hours after the first dose of medicine was given.

In the infected houses where the children were taking the prophylactic, there were twenty-five cases among the adults, who were taking nothing to prevent the disease. If the medicine did not protect the children, why did they escape and the adults take the disease?

Yours respectfully,

J. L. NAPIER, M.D.

NEWS ITEMS.

NEW YORK.

(*From our Special Correspondent.*)

SANITARY INSPECTION OF TENEMENT HOUSES.—On July 9, the Board of Health appointed fifty physicians, who, as temporary assistant sanitary inspectors, are to form the summer corps for the purpose of visiting the tenement houses of the city, and treating any sick children that may be found in them. The city has been divided into fifty districts, and each inspector, during his service of two months, was instructed to visit each house at least twice during that time. Prescriptions, which are advised to be as simple as possible, will, in case the parents are too poor to pay for them, be filled at the Dispensary of the Health De-

partment. Where it is deemed advisable, tickets will be given for the Floating Hospital and the Seaside Nursery. Printed directions regarding the care of infants and on sunstroke are also to be distributed. Dirty houses and streets are to be reported to the Board. The salary is $100 a month.

THE RESIGNATION OF DR. DALTON.—Dr. John C. Dalton, the well-known physiologist, has resigned his position as Professor of Physiology at the College of Physicians and Surgeons which he held for so many years. He will be succeeded by Dr. John G. Curtis, who, for several years past, has been the adjunct professor. Dr. Dalton's resignation is very generally regretted.

WASHINGTON.

(From our Special Correspondent.)

THE UNITED STATES AGRICULTURAL DEPARTMENT AND THE STUDY OF THE GERM THEORY OF DISEASE.—The Agricultural Department has availed itself of the services of Dr. D. V. Salmon, D.V.M., and has established an experimental farm of seven acres—lying on the eastern outskirts of Washington—with facilities for the proper study of the pathological appearances in the diseases of fowls, swine, and cattle, and for the study of inoculation as a preventive of contagious fevers. Dr. Salmon will be assisted by Dr. Rose, who will reside on the farm and devote himself to the treatment and clinical care-taking and make the post-mortems, while Dr. Salmon, at the Agricultural Department proper, will pursue his investigations in the microscopical appearances in the blood of these diseases, and the cultivation of the virus—its attenuation and use in inoculation. Dr. Salmon has already made marked advances in this direction and published such results in our journals (*The American Monthly Microscopical Journal*, April, May, 1881, July, 1882), and in his reports to the Commissioner of Agriculture—as to call forth high praise from those who have followed his investigations. Dr. Sternberg considers that if his work had been done anywhere else than in America, it would doubtless have attracted more attention, both at home and abroad.

Dr. Salmon began his investigations of inoculation in the summer of 1880, and selected fowl cholera. He extracted the blood directly from the heart, using all the means possible to avoid the introduction of foreign germs, and cultivated the germs found in a broth made from the flesh of fowls, which was filtered until limpid, and then sterilized by heat. He gives this process at some length in his published reports. His fluid is an infusion of muscle at the temperature of 160° F., and for three hours boiled, filtered, and neutralized in caustic soda, and his sterilizing apparatus he thinks well adapted to its purpose. Test-tubes are prepared against contamination, half filled with the cultivating fluid; the blood introduced, tightly corked with rubber, which is provided with a bent ventilating tube, tightly packed with cotton, and placed in a vessel containing three or four inches of water that can be tightly covered; this is boiled three or four times, at intervals of a few hours. He makes the positive assertion that prolonged boiling is necessary to proper sterilization. His experiments with a steaming apparatus have not proved satisfactory. He alternates his views by successive dilutions, and considers that his process facilitates exactness in the amount employed, in rapidity of preparation, and in the preservation of the virus for as long a period as possible.

The inoculation is done with a grooved lancet, puncturing between the skin and the muscles of the wing. He found decided evidences of individual susceptibility; thus, one bird died after inoculation with a high dilution of 1 to 40,000, while another resisted a drachm of the pure virus. After these inoculations, there were local lesions, with rise of temperature; but on their restoration to health, they were tested with strong virus, and placed in infected runs with sick birds, but resisted all contagion. Eighty birds had been so inoculated with success at the date of writing.

The virus itself he gives as a form of micrococci, readily obtained by a fresh solution of aniline violet, prepared in strong alcohol, 1 grain to ℥ij of aq. dest., and used at once; and he objects to Klein's apparatus as subject to varying temperatures, which varying temperatures result in the appearing of a different organism, as was admitted by Wood and Formad in cultivating diphtheritic virus, his cemented cell with a thin cover not being sufficient for proper sterilization, and the fluid—the aqueous humor of a rabbit's eye—was not sterilized. The virus is not diffusible through the air, but appears in the excrement, is taken in through the alimentary canal, and the germs are not preserved in the earth as long as six months. In charbon the virus is retained for years by the earth.

He accounts for the failure to discover the bacillus anthracis in the blood, in cases of charbon, after inoculation, as being due to the fact that the virus takes time to work its way from the lymphatics of the skin through the glands to the blood, and that consequently death may occur from chemical poisoning before the bacilli have reached the blood in any appreciable quantity, but that even then they may be cultivated from this blood. His answer to Bert's experiments, of having destroyed the bacilli with compressed oxygen and alcohol, and still found a virulent fluid, from a formless ferment, is that there were live spores remaining which could be cultivated into bacilli. He attaches much importance to Chauveau's success in inoculating with diluted charbon virus on sheep, and to Pench's similar experiments with sheeppox.

In the swine plague Dr. Salmon, contrary to the observations of Klein, gets no bacilli, but does get many micrococci, which, when cultivated and inoculated, resulted in an eruption and elevated temperature. He concludes, therefore, that the reason Klein did not obtain more positive results was that he did not obtain the germ, and calls attention to the fact that Klein did find micrococci and not bacilli in the tissues of the affected animals. Pasteur gave this same view in 1882, but Salmon is quoted as having so expressed himself in the *Agricultural Report* for 1880.

Such experiments as these, made by a department of our Government, bring its operations directly in the range of the intelligent medical practitioner.

DR. JOHN A. OCTERLONY has been recently elected Professor of Obstetrics and Diseases of Women and Children in the University of Louisville, in place of Dr. Theophilus Parvin, recently elected to the Chair of Midwifery in Jefferson Medical College.

THE PRESIDENT OF THE ONTARIO MEDICAL ASSOCIATION.—At the annual meeting of this Association held in June last, Dr. Daniel Clark was elected *President*, and not "Dr. W. Clark," as by mistake stated in our issue of June 23d.

THE ST. LOUIS MEDICAL SOCIETY AND THE CODE OF ETHICS.—In reference to the preamble and resolutions offered by Dr. Pollak at the late meeting of the American Medical Association, the St. Louis Medical Society has adopted the following resolution:

That the St. Louis Medical Society distinctly repudiates the statements contained in said preamble and again expresses its fealty to the existing Code of Ethics

as a time-honored and most suitable fundamental law of the profession, and specially depreciate any action calculated to reflect upon its loyalty to those principles which have heretofore secured immunity from the machinations of schismatics within or enemies without.

THE MICHIGAN STATE BOARD OF HEALTH.—The regular quarterly meeting of the Michigan State Board of Health was held at Lansing, July 10, 1883. The Secretary read his report of work during the last quarter, which showed that a successful sanitary convention had been carried on at Reed City, and arrangements had been made for a convention at Muskegon, August 23d and 24th; that considerable correspondence had been had concerning the examination of plans for proposed buildings at various State institutions; that the report for 1882 had been distributed to various societies, libraries, etc.; that the weekly bulletin of health in Michigan had been regularly prepared and issued; that returns of the names and addresses of about 1200 health officers had been received and filed; that a circular relative to the danger to be anticipated from smallpox, and one relative to the reporting of contagious diseases with appropriate blanks, had been devised and distributed to all local boards of health; that the article entitled "Diseases in Michigan in 1882," had been compiled; that the accumulated letters of the office for the years 1873 to 1881 had been arranged and bound; that the compilation of the articles on "Meteorology in Michigan in 1882," and on "Weekly Reports of Diseases in 1882," was well in hand; that circular 55, relative to the work of health officers, had been revised to conform to the new legislation of 1883, and, if approved by the Board, was ready for publication. The Secretary read a *résumé* of the recent work of other State Boards of Health.

The Board then proceeded to examine plans for proposed public buildings, under the law which requires all plans for State buildings to be submitted to the State Board of Charities, and to the State Board of Health. Plans were examined in detail as follows: For wings to the present school for the blind, at Lansing; for a proposed hospital at the Michigan Asylum for the Insane, at Kalamazoo; for a cottage hospital for the State Public School, at Coldwater; and for a main building for the State Industrial School for Girls, at Adrian, and made record of propositions which were approved, and several recommendations.

On motion of Dr. Lyster, the State Board's Committee on Buildings, including ventilation, etc., was requested to prepare a report on the best plans and methods of construction of hospitals suitable for the various State institutions.

GASTROSTOMY.—MR. J. GREIG SMITH reports a case of gastrostomy for malignant stricture of the œsophagus, the patient also having a hydatid cyst of the liver.—*Bristol Medico-Chirurg. Journal*, July, 1883.

THE GROCER'S COMPANY PRIZE.—The Court now announces as the subject for competition for the prize of £1000 the following problem: "To discover a method by which the Vaccine Contagium may be cultivated apart from the animal body, in some medium or media not otherwise zymotic; the method to be such that the Contagium may by means of it be multiplied to an indefinite extent in successive generations, and that the product after any number of such generations shall (so far as can within the time be tested) prove itself of identical potency with standard Vaccine Lymph." The prize is open to universal competition, British and foreign. Competitors for the prize must submit their respective treatises on or before the 31st of December, 1886; and the award will be made as soon afterwards as the circumstances of the competition shall permit, not later than the month of May, 1887. In relation to the Discovery-Prize, as in relation to other parts of the Company's scheme in aid of sanitary science, the Court acts with the advice of a scientific committee, which at present consists of the following members: John Simon, C.B., F.R.S., John Tyndall, F.R.S., John Burdon Sanderson, M.D., F.R.S., and George Buchanan, M.D., F.R.S. All communications on the subject as to conditions, etc., are to be addressed to the Clerk of the Grocer's Company, Grocer's Hall, London, E.C.—*Edinburgh Med. Journ.*, July, 1883.

DR. SPINA, assistant in Professor Stricker's laboratory, at Vienna, who has recently been prominently before the profession in opposition to Koch's theory of the bacillus tuberculosis, has been nominated Professor of General and Experimental Pathology at the University of Prague.

HEALTH IN MICHIGAN.—Reports to the State Board of Health for the week ending July 7, 1883, indicate that intermittent fever, cholera infantum, remittent fever, diarrhœa, dysentery, and bronchitis have increased; and that inflammation of bowels has decreased in area of prevalence.

Including reports by regular observers and by others, diphtheria and scarlet fever were each reported present during the week ending July 7, and since, at 10 places; and measles at 15 places. The last case of smallpox (in Kalamazoo Township) was reported dismissed July 7.

OFFICIAL LIST OF CHANGES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM JULY 9 TO JULY 16, 1883.

BAILY, E. I., *Colonel and Surgeon.*—In addition to his present duties, to take charge of the Office of Medical Director, Military Division of the Pacific, during the absence of the Medical Director.—*Par. 2, S. O. 64, Military Division of the Pacific, June* 30, 1883.

CAMPBELL, JOHN, *Lieutenant-Colonel and Surgeon, Medical Director, Department of the South.*—Leave of absence on Surgeon's certificate of disability, granted by S. O. 50, Department of the South, May 21, 1883, extended one month, on Surgeon's certificate of disability, with permission to leave the Department of the South.—*Par. 7, S. O. 156, A. G. O., July* 9, 1883.

MAGRUDER, D. L., *Lieutenant-Colonel and Surgeon, Medical Director, Headquarters Department of the Missouri.*—Granted leave of absence for one month, with permission to apply for an extension of one month.—*S. O. 145, Department of the Missouri, July* 12, 1883.

SUTHERLAND, C., *Colonel and Surgeon, Medical Director, Military Division of the Pacific.*—Granted leave of absence for one month, with permission to apply to the Adjutant-General of the Army for extension of two months.—*Par. 1, S. O. 64, Military Division of the Pacific, June* 30, 1883.

PERLEY, HARRY O., *Captain and Assistant Surgeon.*—Assigned to duty at Fort Pembina, D. T.—*Par. 1, S. O. 118, Department of Dakota, July* 5, 1883.

THE MEDICAL NEWS *will be pleased to receive early intelligence of local events of general medical interest, or of matters which it is desirable to bring to the notice of the profession.*

Local papers containing reports or news items should be marked.

Letters, whether written for publication or private information, must be authenticated by the names and addresses of their writers—of course not necessarily for publication.

All communications relating to the editorial department of the NEWS *should be addressed to No. 1004 Walnut Street, Philadelphia.*